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THE RESEARCH PROGRAM OF USDA

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Statement of E. L. Peterson, Assistant Secretary of Agriculture, before the Federal Council on Science and Technology, April 28, 1959.

My discussion will be in five parts: (1) how research has helped this country to advance to a position of world leadership in Agriculture; (2) the demands on agricultural research in the next 50 years; (3) the organization for research coordination and program development in the Department of Agriculture; (4) the relation of the research in USDA to the programs of other Federal agencies; and (5) current problems in the management of research. I shall refer to a number of charts. These are attached to this statement.

1.

The history of farming in this country may be divided broadly into three periods. The first -- from Colonial times through World War I -- was a period of physical growth by the development of new lands. In general, total farm output during this first 300 years increased only as additional cropland was put under the plow. Acre for acre, crop yields remained about the same.

Fortunately, there were farsighted individuals during this early period who knew that good farmland would one day all be farmed, and that if we were to build a great Nation something had to be done to increase farming efficiency. The efforts of these individuals brought about the establishment, 100 years ago, of the Land Grant Colleges and the U. S. Department of Agriculture.

Research was encouraged, and new farm practices began to emerge. But even 50 years later crop yields on the average remained the same. Many changes in land use occurred that should have improved yields. Vast areas of highly fertile virgin land were plowed up, and worn-out areas were discarded. Millions of acres of potentially productive wet land were drained. Fertilizer and lime use increased to substantial quantities. New, higher yielding crop varieties were introduced and controls were developed for a number of insect pests and crop diseases. Yet with all these improvements yield levels stayed about the same.

There was only one possible conclusion. All the improvements in farming that had been made had barely succeeded in offsetting the decline in soil productivity that was taking place.

Public concern over this situation was mounting by 1908, when President Theodore Roosevelt convened the first Governor's Conference to consider resource problems. Out of this conference emerged the conservation idea.

The second period in our farming history -- covering roughly the years between the two World Wars -- is notable for two developments. The first of these was the application of mechanical power in farming, which gradually released millions of acres from the production of feed for horses and mules. These acres became available for food production. The second important development was the action taken, on a broad front, by the Federal government, by the States, by industry, and by farmers to improve our agriculture. Research was given increased recognition.

The third period in our farming history is the one we are in now. Today we can see the fruits of the efforts started in the earlier periods.

In 1939, when World War II broke out in Europe, American farmers produced a  $2\frac{1}{2}$  billion-bushel crop of corn on 88 million acres. Last year, they produced a record 47 percent more on 15 million less acres. The story repeats itself with virtually all major crops. The 740 million bushels of wheat produced in 1939 took  $52\frac{1}{2}$  million acres. Last year, on about the same acreage, the crop was 1 billion, 460 million bushels -- virtually double that in 1939. Production of oilseed crops has almost tripled since 1939.

It is the same with livestock. In 1958 we had nearly  $3\frac{1}{2}$  million fewer dairy cows than in 1939, but each cow produced 7/8ths of a ton more milk during the year. For every two eggs a hen laid in 1939, her descendant is laying about 3 eggs today. Total egg and poultry production is up 108 percent. We have 97 million cattle and horses on the same pastures and range lands that in 1939 supported only 81 million head. We had a pig crop of 95 million in 1958 on the same farm plant that produced 87 million in 1939.

All told, we produced 54 percent more farm commodities last year on fewer acres than we had in 1939.

But these facts and figures alone don't tell the whole story. Figures on manpower required to do the job also are significant. In World War I, we produced our farm commodities with  $13\frac{1}{2}$  million workers; in World War II, with  $10\frac{1}{2}$  million workers; today there are only  $7\frac{1}{2}$  million farm workers.

If the agricultural output we achieved in 1957 -- the latest year for which we have complete figures -- had been produced by the methods available to farmers in 1939, it would have cost the Nation about  $7\frac{1}{2}$  billion dollars more in land, labor, capital, and other resources than the actual cost in 1957. These  $7\frac{1}{2}$  billion dollars were therefore available for other improvements in our levels of living.

The story is not all bright, however. From the economic standpoint, as you well know, farmers have not shared equally with the rest of us in the progress our country has made during the past two decades. They benefited greatly from the adoption of technological improvements when the markets were expanding during World War II and the rehabilitation years. Their purchasing power rose rapidly, and they began to pay debts, to buy land, livestock, and equipment, and to make many farm and home improvements. But as the general level of prices rose, it brought rising costs for farm labor, machinery, and production supplies of all kinds. Then, when the special needs of war and rehabilitation had been met, prices received by farmers began falling, and surpluses began piling up. Thus, in recent years, farmers have been caught in a cost-price squeeze. And the burden of farm surpluses has been felt by the entire economy. The effects of high farm costs and narrow farm margins have been offset in some measure by changes in farm owner's equities which have increased from 43 billion dollars in 1940 to 167 billion dollars in 1958.

Today our most urgent problem is to find new ways of expanding markets for the abundance now produced on our farms.

Research needs to develop new industrial uses for agricultural commodities. At the same time, it needs to give farmers new techniques for producing commodities of uniform quality in high volume -- for producing them in ways that are profitable to farmers and at costs that permit competition with other industrial raw materials.

It is important to keep in mind that while our public agricultural research involves both Federal and State action, it is essentially a single program directed to a single purpose -- the most efficient production, processing, marketing and distribution of the products of the farms and ranches of this country. The States do a part of the research themselves. The Department does a part by itself. More than half of the total is a cooperative enterprise. The excellent cooperative relations between the States and the Department have made it possible to mesh the parts of the program together into a whole that serves the nation effectively.

Private sources either engaged in the processing and marketing of farm and forest products or in serving the farm market complement public research efforts. We estimate that private funds going into agricultural research are approximately equal to public funds. The private research is predominantly in the processing and marketing fields, but substantial funds are spent on agricultural machinery and agricultural chemicals.

In agriculture we have a unique system for bringing the results of research to users. The State Extension Services in cooperation with the Department have played a most significant role in the agricultural improvement that has taken place.

2.

And now let us look to the future.

We're all aware of the present rapid increase in our population and the predictions that this trend will continue. The Census Bureau estimates that by the year 2010 we may have 370 million people -- more than twice the population we have today.

This means that just to maintain our present diet levels, we will require twice as much food and other farm products as we're consuming today. New knowledge of nutritional requirements, especially for older and younger age groups, is emphasizing the need for more protective foods -- those high in protein, vitamins, and minerals. Meat, milk and eggs, and fruits and vegetables provide these nutrients, but they're also the foods with high production and processing costs. To make our people 50 years from now as well fed as they should be, farmers will have to at least double their present crop output and more than double present production of livestock products. The demand for timber products can be expected to increase by 80 percent in 40 years.

At the same time, the amount of farmland available is not likely to be increased much beyond the acreage farmers are using today. Some new land can be brought into production by various methods. But, as our population increases, considerable present farm land will go into urban and other non-farm uses. Trends also indicate that our farms will continue to increase in size and decrease in numbers, and that additional farm workers will seek part- or full-time employment in towns and cities.

In summary, then, we can expect that tomorrow's farmers -- with only a little more land and considerably less manpower -- will have to produce for a rapidly increasing population, whose needs and desires will influence, more and more, the kinds and qualities of products produced. Despite our present abundance, these demands will not be met unless ways are found to further increase efficiency throughout agriculture.

The size of the job in the next 50 years is compared with recent accomplishments in Chart A. 1956 yields per acre are used to make comparisons. The year 1956 was chosen since it is midway between 1935-39 and 1975. In 1935-39, we actually used 526 million acres of cropland equivalent to produce our farm output as is shown in the bar on the left. With 1956 yields per acre only 384 million acres of cropland

equivalent would have been required in 1935-39 as is shown in the bar on the right. Between 1935-39 and 1956, we made enough improvements in farm practices to be equivalent to the production from 142 million acres. The two bars for 1956 are the same. That is, we used 506 million acres in 1956 and the same acres at 1956 yields were required to produce the 1956 output. The bar on the left for 1975 shows the same acreage as in 1956. The bar on the right shows the acreage required in 1975 assuming 1956 yields per acre. It is expected that we may increase our cropland by 25 million acres between 1956 and 1975. Putting what is now known in research into practice, that is converting basic information into applied results, will increase production in 1975 enough to be equivalent to 160 million acres at 1956 yields per acre. The remaining 23 million acres required can be achieved by new findings in research in the next 5 years. It takes from 10 to 15 years to translate basic information into farm practices. The total improvement in farm practices between 1956 and 1975 that is required to meet national requirements is equivalent to the production from 183 million acres at 1956 yields per acre. This means that the improvements in farm practices between 1956 and 1975 must be 1.3 times as great as those made for the period of equal length between 1935-39 and 1956. Now let us look to 2010. The bar on the left again shows the acres that were available in 1956, plus the new acres and technology added between 1956 and 1975. The bar on the right shows the acreage that would be required in 2010 at 1956 yields per acre. To meet requirements in 2010, we must improve agriculture enough between 1975 and 2010 to be equivalent to the production from 417 million acres at 1956 yields per acre. This is 1.6 times the annual rate of progress that we made between 1935-39 and 1956.

Farmers will have to do a better job of conserving soils and using available water supplies. They will need higher yielding strains of crops and livestock with specific qualities to meet special market demands -- lean, tender beef, for example . . . milk with more solids and less fat . . . eggs that retain their initial high quality . . . fruits and vegetables more suitable for freezing and canning . . . field crops with qualities especially useful to industry. Farmers will need more economical and effective methods of controlling diseases, insects, weeds, and weather . . . better fertilizer practices, machines, and other production tools. And they will need to fit these improvements together into economical farm operations that are flexible enough to allow adjustments in response to changes in market demands.

Furthermore, agricultural efficiency no longer stops at the farm gate. It extends into the market place, the processing plant, the retail store, and the home -- wherever farm products are ultimately used. It means

maintaining the quality of products after they leave the farm. It means efficient and economical methods of handling, processing, and distribution. And it means efficient utilization of all agricultural commodities -- whether as industrial raw materials or as consumer end-products.

All these things contribute to total agricultural efficiency. And the only way that I know they can be achieved is through agricultural research — pursued vigorously and steadily by both public and private agencies.

In the Department of Agriculture, we have been concerned with this problem for some time. We've been giving a great deal of thought to the kind of research that will help us to make the most progress over the long term.

We have become convinced that our greatest need is for basic research to discover new principles and new methods that will help us to understand fundamental biological processes.

We are fortunate to have seen in our own lifetime how basic research in the physical sciences has given man new power to manage molecules and new insight even into the nucleus of the atom. We are now in the golden era of the physical sciences. The next golden era in science will be in the biological sciences. It will come as we gain understanding of the cell as the unit of life.

The findings of this research promise to rival in importance anything that man has ever done. They will be particularly important to agriculture. If we can better understand and control the mechanisms and functions of living cells, we will have vastly increased ability to breed more productive, higher quality crops and livestock . . . to manage forests . . . to control or eradicate diseases and insect pests . . . to maintain the quality of farm products during processing and marketing . . . to find new uses for farm-grown raw materials . . . and to improve human nutrition.

3.

I would like now to review briefly the organization we have in the Department for conducting research.

I will refer to a number of charts. The first one shows the overall Department organization, divided -- on the basis of service -- into four major groups: Federal-States Relations, Marketing and Foreign Agriculture, Agricultural Stabilization, and Agricultural Credit Services.

Five of the operating agencies -- indicated by asterisks -- are engaged in research. Two -- Agricultural Marketing Service and Foreign Agricultural Service -- are located organizationally in the Marketing and Foreign Agriculture group, headed by Assistant Secretary Miller. The other three -- Agricultural Research Service, Farmer Cooperative Service, and Forest Service -- are located in the Federal-States Relations group, for which I have responsibility. In addition, I have been assigned general responsibility for the development of research policy for the Department.

#### Research Coordination and Program Development

The second chart shows our over-all organization for research coordination and program development. Coordination of all research in the Department is delegated to the Administrator of the Agricultural Research Service, Dr. Shaw, who reports directly to me. In exercising his co-ordinating responsibilities, Dr. Shaw provides for the examination and analysis of all research activities, current and contemplated; for review and approval of all proposed projects before they are initiated; for advice and consultation with agency heads on the planning of research; and for submission of reports and recommendations to the Secretary.

Dr. Shaw is assisted in this work by the Central Project Office, and by an Agricultural Research Council, whose members are the Deputy Administrators for research in ARS and AMS, the Director of Home Economics research in ARS, the Assistant Chief for research in the Forest Service, and the Administrators of the Foreign Agricultural Service and the Farmer Cooperative Service.

The Central Project Office serves as a control center in the review and approval of research proposals. Each proposed project is examined in this office in relation to the existing program and is referred for comment to any part of the Department doing related work, including subject-matter specialists in the State Experiment Stations Division of ARS, who consider it in relation to research going on at the State stations. The proposal, with all comments, is then returned to the initiating Division for resolution of differences. If the differences are resolved, the project then moves to the appropriate Research Council member for approval or disapproval. If differences are not resolved, they are referred to the council member, who seeks resolution with other council members concerned. Where differences still remain, the case is submitted to the Administrator of ARS for settlement.

The Agricultural Research Council also provides a forum for discussion of problems in research or research operations of Department-wide concern. It advises the ARS Administrator on matters needing attention.

In program development, the Department is assisted by a number of advisory committees. First, is the 11-member Agricultural Research Policy Committee, which advises on policy and broad adjustments needed to maintain a dynamic research program. It maintains continuous contact with the other 25 functional and commodity Research Advisory Committees, which largely represent groups that use the findings of research. They review current research and recommend adjustments including termination of existing projects, expansion of current work, or initiation of new work. The Advisory Committees are kept in close touch with the Department program through the Committee secretariat, which serves as liaison between them and Departmental Working Groups representing each of the program activities concerned.

Our total research program is divided into five major areas: (1) Farm research, (2) Utilization research and development, (3) Home Economics research, (4) Forest research, and (5) Marketing research. In addition, we have responsibility for Federal-grant funds appropriated for research at State Experiment Stations, and the new Foreign Contracts and Grants program conducted under P. L. 480. The next series of charts shows how these are organized. A more complete discussion of these organizational units is given in an attachment.

#### Farm Research

Chart No. 3 shows our organization for farm research. Dr. Byerly, our Deputy Administrator for Farm Research, has responsibility for the seven farm research divisions -- Soil and Water Conservation, Crops, Animal Disease and Parasite, Entomology, Agricultural Engineering, Animal Husbandry, and Farm Economics.

A major responsibility, inherent in all our research programs but especially important in farm research, is the service that must be provided to non-research programs of the Department. We believe we have been able to incorporate farm research findings effectively and rapidly into our other programs, such as agricultural extension work, plant and animal regulatory activities, and soil and water conservation program.

#### Utilization Research and Development

Chart No. 4 shows our Utilization Research and Development organization. Dr. Irving is the Deputy Administrator for Utilization Research. The four divisions, each serving a region, are headquartered in Philadelphia, Peoria, Illinois, New Orleans, and Albany, California.

In our utilization research, it is especially important that we maintain close working relationships with industry. We do this in many ways. Technical liaison personnel located at the regional laboratories are especially effective in keeping industry informed on research progress and in bringing industry's needs for materials to the attention of the laboratory directors. We are also developing closer relationships with industry through our research contracts. For the Department as a whole, we now have approximately 200 research contracts in force totaling close to \$4 million, and divided roughly fifty-fifty in terms of public and private organizations doing the work. Contract research has become well assimilated in our total research program. As we are able to use the authority, provided last year, to make grants for basic research, I believe we will take another important step forward in our research.

#### Home Economics Research

Chart No. 5 shows our home economics research organization. Dr. Stiebeling, Director of the Institute of Home Economics, is responsible for the work of this group of three research divisions -- Clothing and Housing, Household Economics, and Human Nutrition. The Director of the Institute and the three divisions under her leadership bear the same relationship to the ARS Administrator as do the Deputy Administrators and divisions in farm and utilization research. While nearly all our research benefits consumers as well as farmers the work in home economics is especially oriented toward consumers.

#### Forestry Research

Chart No. 6 shows the research of the Forest Service, in which an Assistant Chief, Dr. Harper, has responsibility for the planning and execution of research in the eight research divisions -- Forest Management, Range Management and Wildlife Habitat, Watershed Management, Forest Products Utilization, Forest Economics, Forest Fire, Forest Insect, and Forest Disease. Dr. Harper carries responsibilities similar to those of the Deputy Administrators in the ARS.

#### Marketing Research

Next, Chart No. 7 shows our organization for marketing research, most of which is located in the Agricultural Marketing Service. A Deputy Administrator, Dr. Herrmann, has responsibility for research done in three AMS divisions -- Agricultural Economics, Agricultural Estimates, and Marketing Research.

Specialized marketing research dealing with problems of farmers' co-operatives is conducted in the Farmer Cooperative Service. Research on foreign markets and competition is conducted in the Foreign Agricultural

Service. In both of these agencies, the amount of research is relatively small, and the Administrators -- Dr. Knapp and Dr. Myers -- are responsible for planning and carrying out the work.

The charts I have shown thus far represent the Department's regular research programs, including research done under contract by domestic organizations outside the Department. In addition, we have two other research programs for which we have administrative responsibility.

#### State Agricultural Experiment Stations

Chart 8 shows our organization for administering the Federal-grant funds appropriated to the Department for research by State agricultural experiment stations. These funds are administered by the State Experiment Stations Division of the Agricultural Research Service. We have a Deputy Administrator, Dr. Elting, who is responsible for the activities of this Division and also for our Territorial Experiment Stations Division, which administers Federal research in Puerto Rico, the Virgin Islands, and the State of Alaska.

I want to stress that the Department's role in the Federal-grant research program is primarily one of service. Although we are charged with responsibility for seeing that the funds are spent as intended by the Congress, a further responsibility is the technical assistance we are called on to give. This assistance, which is provided by the State Experiment Stations Division, includes comprehensive reviews of Federal-grant research, participation in planning of regional research, and coordination of research effort among the States as well as between the States and the Department.

Records of some 12,000 Federal-grant and State-supported projects are maintained in the Division. A series of research summaries by various subject-matter fields, indicating the nature and purpose of projects supported with Federal-grant funds, is published biennially.

These broad review and coordinating services help both the State experiment stations and the Department to avoid duplication of effort, to recognize gaps that need to be filled, and to plan and carry out a more effective Federal-State program of agricultural research.

I want to stress, too, the close working relationships between the Department and the State agricultural experiment stations in all of our research. We cooperate formally on more than half of our research, and informally on most of the rest. I am convinced that this Federal-State cooperative system is largely responsible for the outstanding progress that has been made in agricultural research during the last

70 years. It is a system of which we can all be proud. No other Nation has anything just like it, and foreign agricultural officials and other visitors always express keen interest in learning how it came about and how it operates.

#### Foreign Contracts and Grants

Chart No. 9 shows the organization for our recently inaugurated Foreign Contracts and Grants research program. This program covers all fields of Department interest and is administered by a Director, Dr. Hilbert, reporting to the Administrator of ARS. We have one field office already established in Rome, and two additional ones are planned for Asia and South America.

The Director of the program receives guidance from a Policy and Program Development Board, composed of deputy administrators for research in ARS, AMS, and FS, plus the deputy administrator of the Foreign Agricultural Service.

Review, analysis, and recommendations regarding proposed and going research projects overseas are the responsibility of the deputy administrators for research. That is, they determine whether proposals are in conformity with the criteria established for foreign research of interest to their particular research program and whether satisfactory progress is being made. The deputy administrator for research in each agency has the same technical responsibility for foreign research that he has for domestic research. Dr. Hilbert has administrative responsibility for the program and, through the Foreign Contracts and Grants unit under his direction, makes and administers all research agreements with foreign institutions.

We expect to obligate foreign currencies resulting from the sale of surplus farm commodities under P. L. 480 to the extent of about \$10 million (U. S. dollar equivalent) during this fiscal year. These funds will cover the entire cost of contracts and grants that are executed this fiscal year and will be spent over a 5-year period. This is to assure that money will be available to complete any overseas research jobs that are started.

I want to stress that this foreign research is supplementary to our own domestic program. We are looking for institutions having scientific personnel with specialized experience and facilities that will enable them to carry out research that will advance our interests.

We know there is a vast reservoir of scientific manpower in the free world outside of the United States. We believe, through the P. L. 480 program, that we can help to make more effective use of this manpower in seeking answers to problems of mutual interest.

Responsibilities Clearly Established

In summing up my remarks on our total organization for research in the Department, I would like to stress these points. First, one official, in the Secretary's Office, is responsible for research policy. Reporting to him is one man with responsibility for coordinating and integrating all research in the Department. Second, we have one person in charge of each phase of agricultural research -- farm, utilization, home economics, forestry, marketing, Federal-grants, and foreign research. In short, definite responsibility is established from the Secretary's Office down to the divisions engaged in research. We also have the benefit of continuing advice from citizen groups who need and use the results of our research.

4.

We have extensive cooperation in research with many Federal agencies. In some cases funds are transferred to us by the other agencies for specific research of interest to them. In other cases we transfer funds to the other agencies to get their help on problems of interest to Agriculture. But in most cases we work cooperatively with one or more agencies, each spending its own funds, on problems of mutual interest. I shall mention a few examples.

We worked with the Defense Department to flameproof military clothing -- to stabilize nitrocellulose -- to develop the blood plasma extender, dextran -- to develop dehydrated and compressed foods -- to provide better packaging materials -- and to work out methods of predicting soil trafficability for military vehicles. Our food and nutrition research were the basis for the development of survival rations for the Army and Navy. Our aerosol bomb won the battle of the bugs for the military and drastically reduced casualties from pest-borne diseases. We developed a two-way-stretch cotton bandage and a starch sponge to help in treating military casualties. These are just a few of the many ways we work with the Department of Defense.

Some of the ways we work with the Department of the Interior include research on hydrology, on synthetic liquid fuels, on controlling weeds in canals and on public lands, and in estimating the benefits of flood control and water storage projects.

We cooperate with the Department of Health, Education, and Welfare on many problems. Among them are research on air pollution, diseases affecting man and animals, safety of pesticides, drugs and feed additives, and human nutrition.

Likewise we cooperate with the Departments of Commerce, Labor, Treasury and State. We also cooperate with the Atomic Energy Commission, the

National Science Foundation, the Office of Civil and Defense Mobilization, and the Smithsonian Institution. We are looking forward to increased cooperation with National Aeronautics and Space Administration. We think our knowledge of biology will be helpful in devising the closed system ecology that will be necessary to maintain men in space for extended periods.

We believe our work has been helpful to other agencies and we know that their assistance has been of great value to us.

5.

In concluding my statement, I want to call attention to a few of the problems we have in the management of research. The first concerns the wide dispersal of our research resources. The locations of research are shown on the map in Chart B. We are concerned that current research efforts are spread too thinly. It is difficult for a small field station manned by one, two, or three scientists to be really effective.

We now have a committee composed of State Experiment Station Directors and Department leaders who are exploring the possibility of greater concentration of research in fewer locations. We are hopeful that we can work out plans for greater concentration of research so that for the same money now spent for research at scattered locations, we can develop centers in each State where groups of scientists with more adequate support can do a more effective job of research on regional and national problems and at the same time provide a valuable training ground for graduate students.

Our second problem is basic research. We are pleased that more than 20 percent of the research funds spent by the Land-Grant Colleges and the Department go to basic research. However, a still greater share of our resources should go into fundamental work. We shall continue to press in this direction.

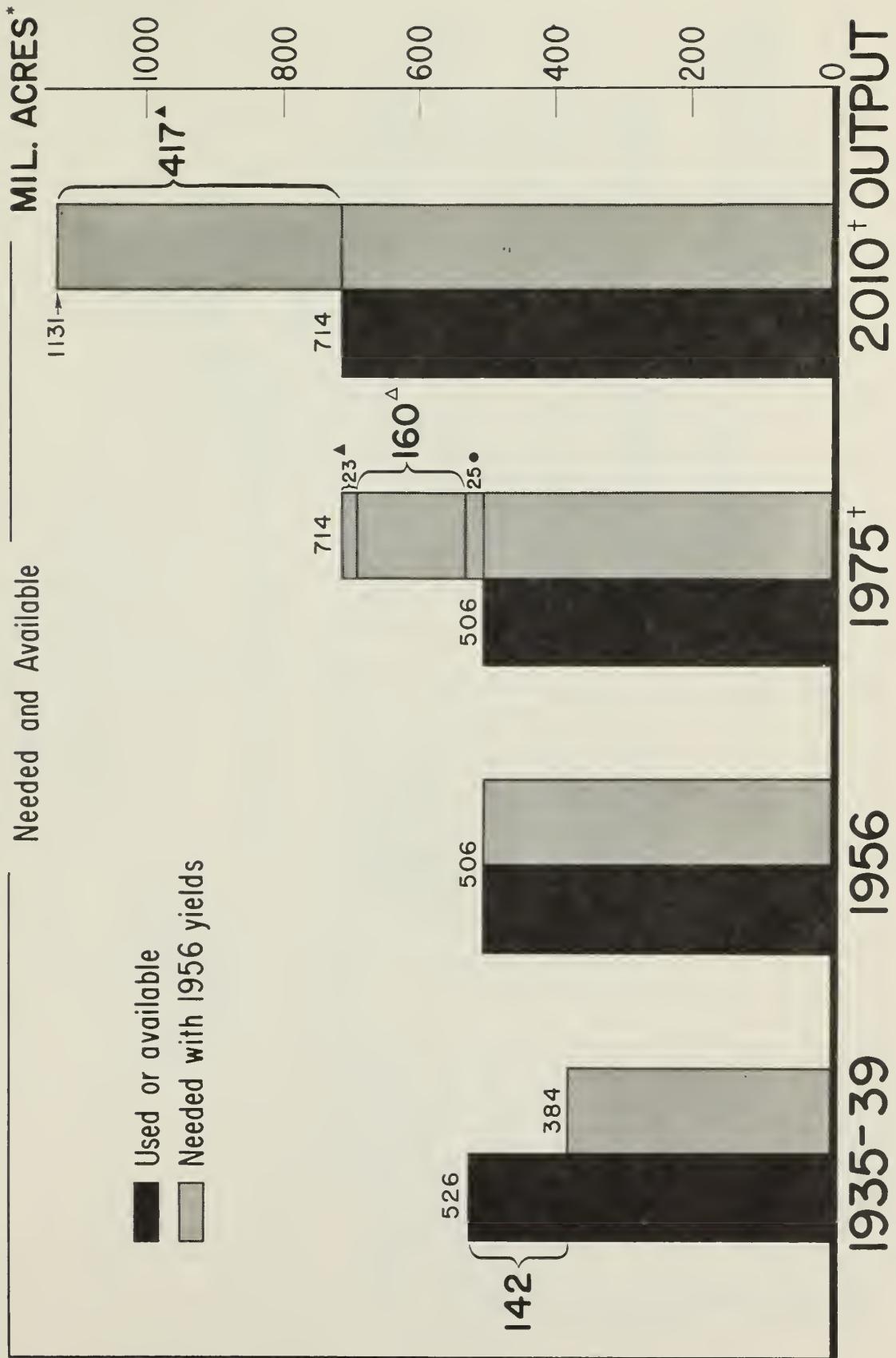
A limiting factor in our research is the lack of modern facilities. We estimate that the total cost of modernizing State and Federal agricultural research facilities is on the order of \$400 million.

There is also a need for adequate supporting help for our professional scientific staff. In my opinion, the scientific productivity of our present staff of scientists could be increased from 25 to 50 percent if facilities, junior scientists, sub-professional help, and labor to assist them in conducting research for which they are so highly qualified were provided to the optimum extent. In addition, there is urgent need to strengthen agricultural research on all fronts if we are to cope with current and emerging problems.

Lastly, we, along with other public scientific agencies, need to be able to pay scientists salaries that are commensurate with their worth. A liberalization of Public Law 313 authorities would be helpful. We have only 5 of these authorities for a research staff of over 11 thousand people.

You may be interested in the two tables attached on current funds and personnel.

# HARVESTED ACREAGE



\* CROPLAND EQUIVALENT EXCLUDING FRUIT, TRUCK, MISC. CROPS    △ YIELDS AND FEEDING EFFICIENCY ATTAINABLE FROM KNOWN TECHNOLOGY

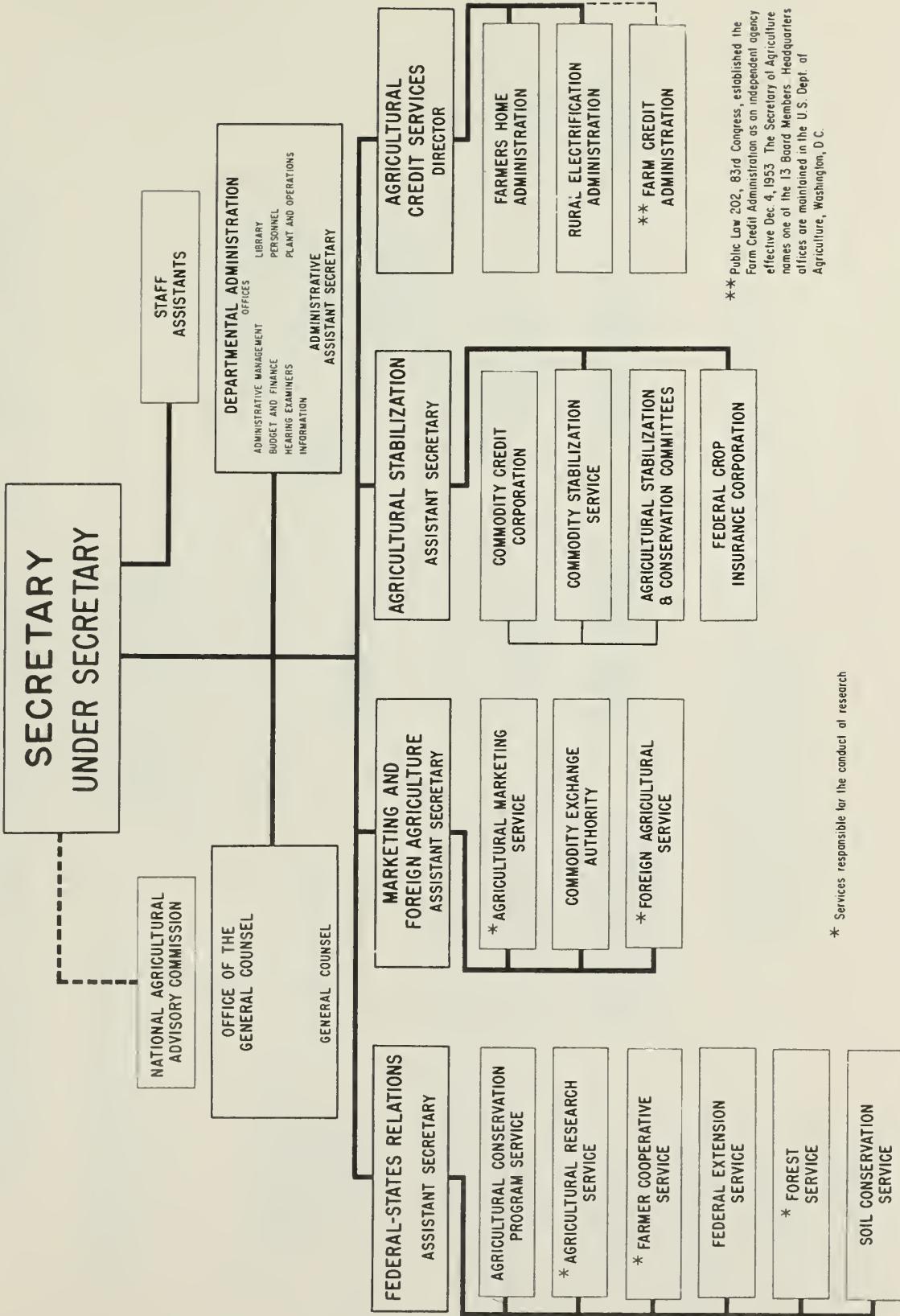
† NEW CROPLAND    ▲ JOB TO BE DONE

● 1975 = 228 MIL., 2010 = 370 MIL. POPULATION  
U. S. DEPARTMENT OF AGRICULTURE

CHART A  
AGRICULTURAL RESEARCH SERVICE

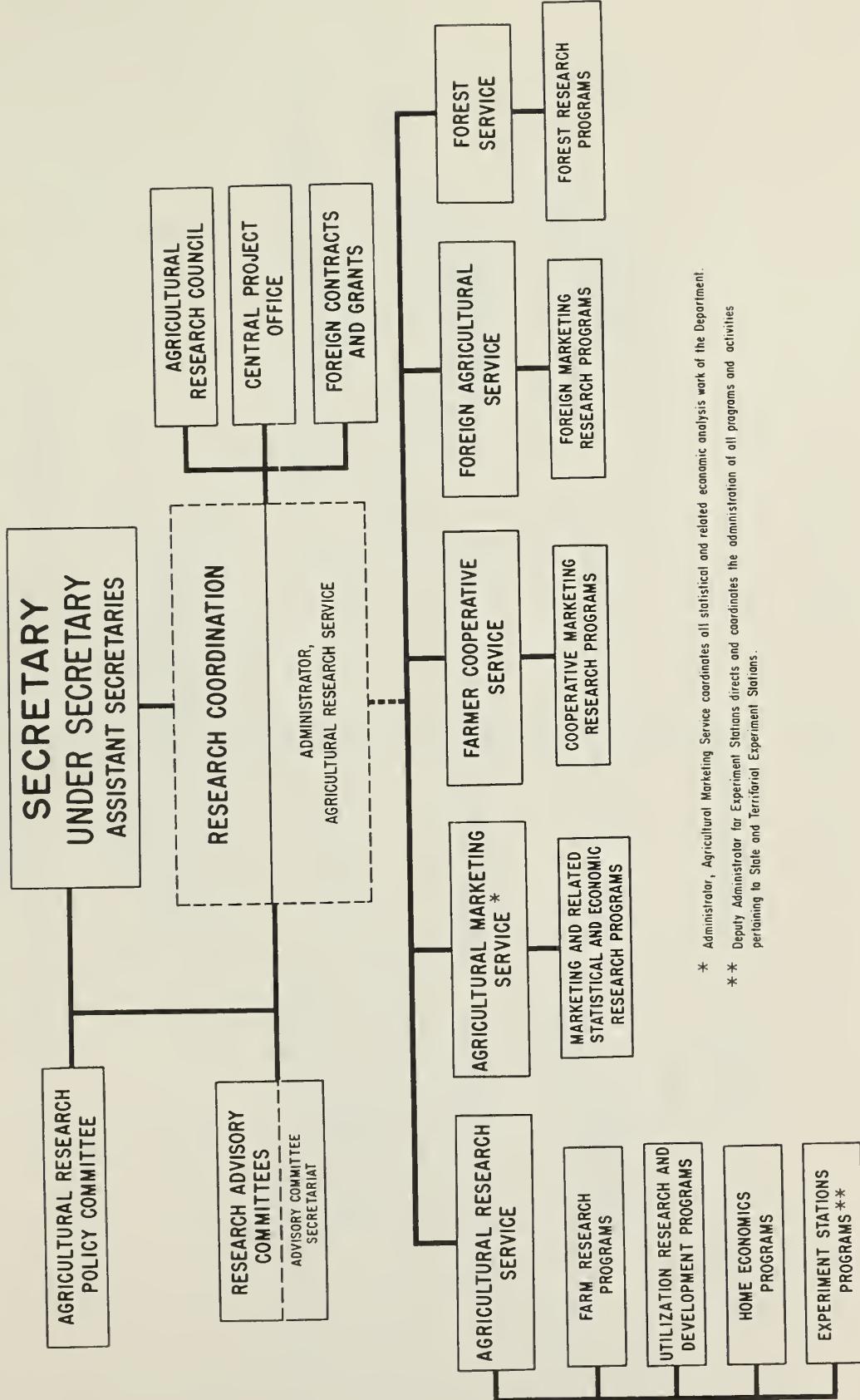


# UNITED STATES DEPARTMENT OF AGRICULTURE





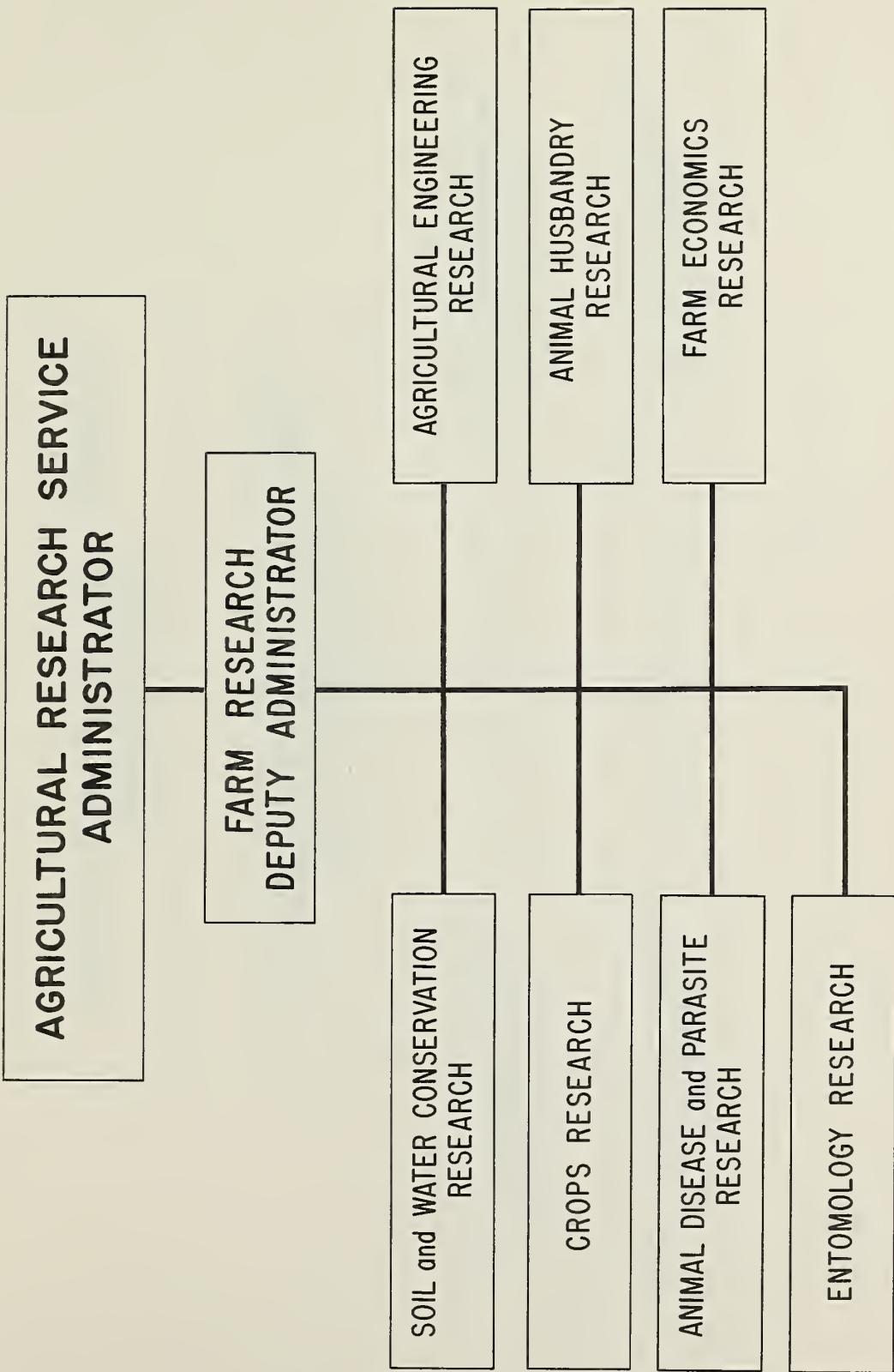
# ORGANIZATION FOR RESEARCH COORDINATION AND PROGRAM DEVELOPMENT IN THE USDA



\* Administrator, Agricultural Marketing Service coordinates all statistical and related economic analysis work of the Department.

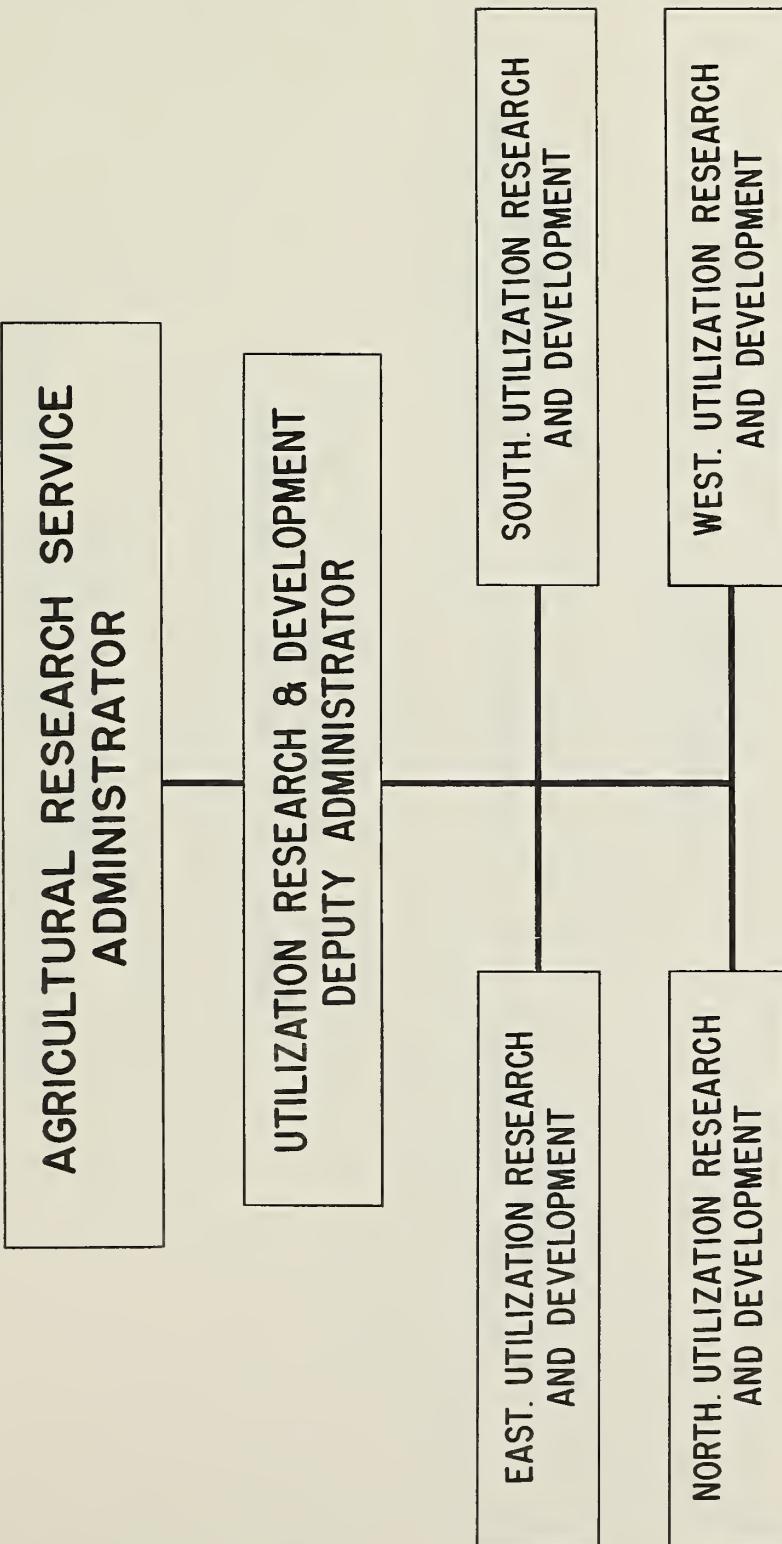
\*\* Deputy Administrator for Experiment Stations directs and coordinates the administration of all programs and activities pertaining to State and Territorial Experiment Stations.





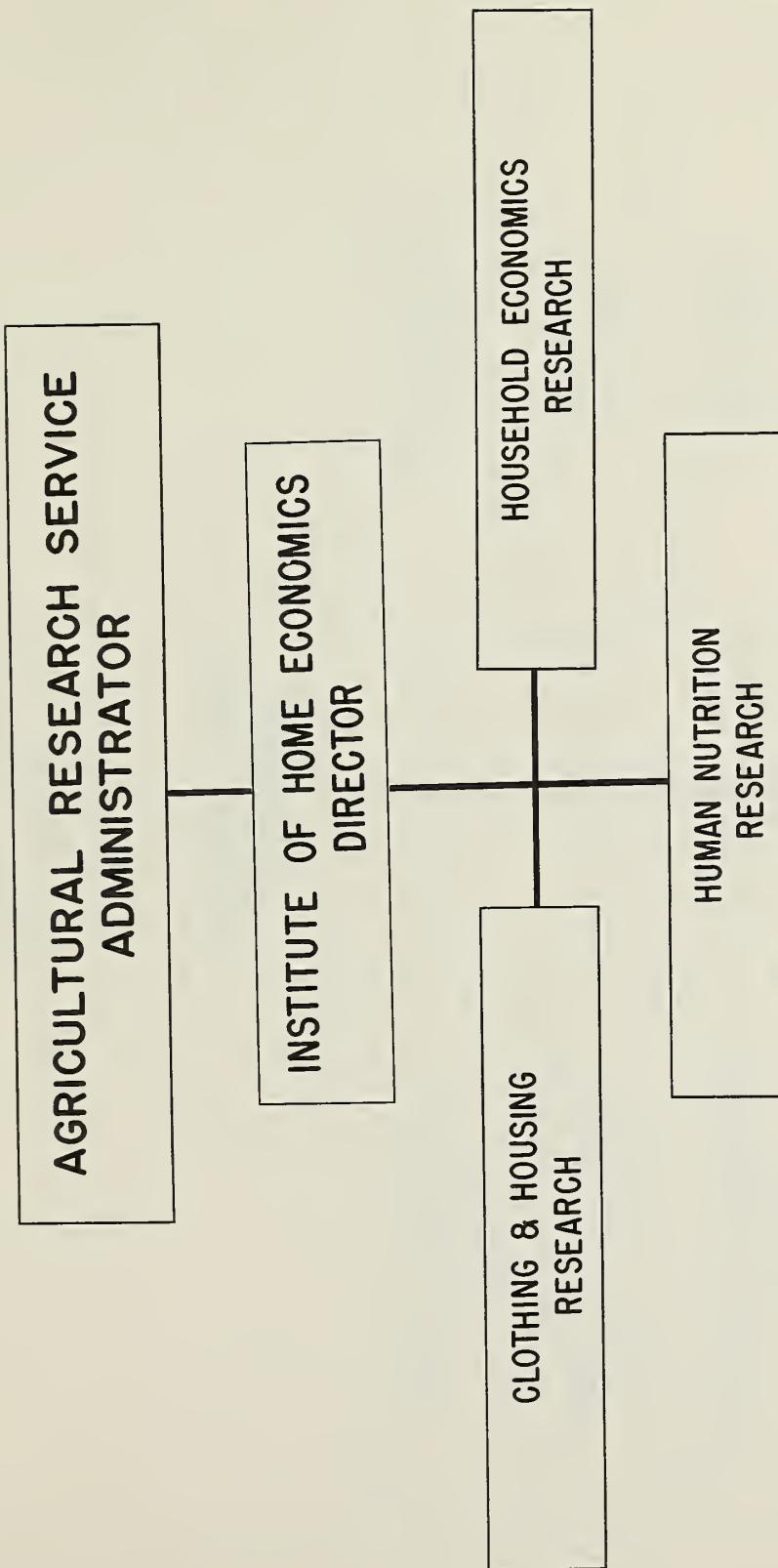
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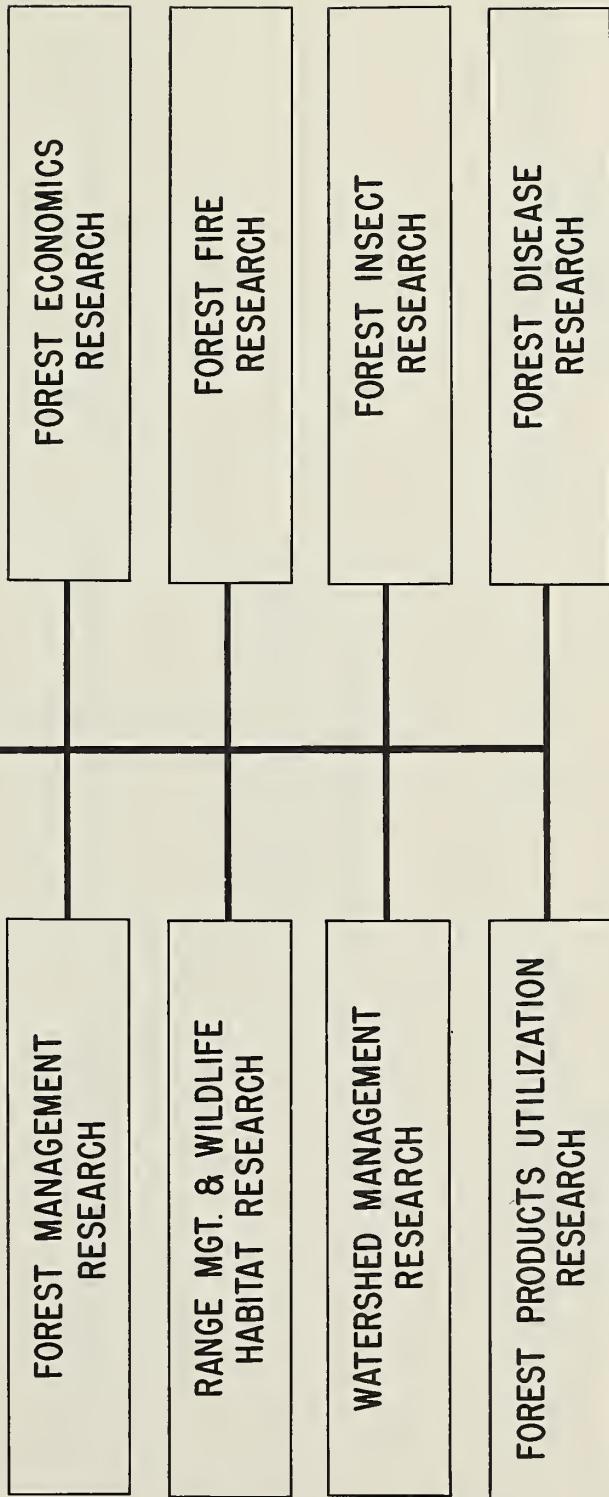


D I V I S I O N S



**FOREST SERVICE  
CHIEF**

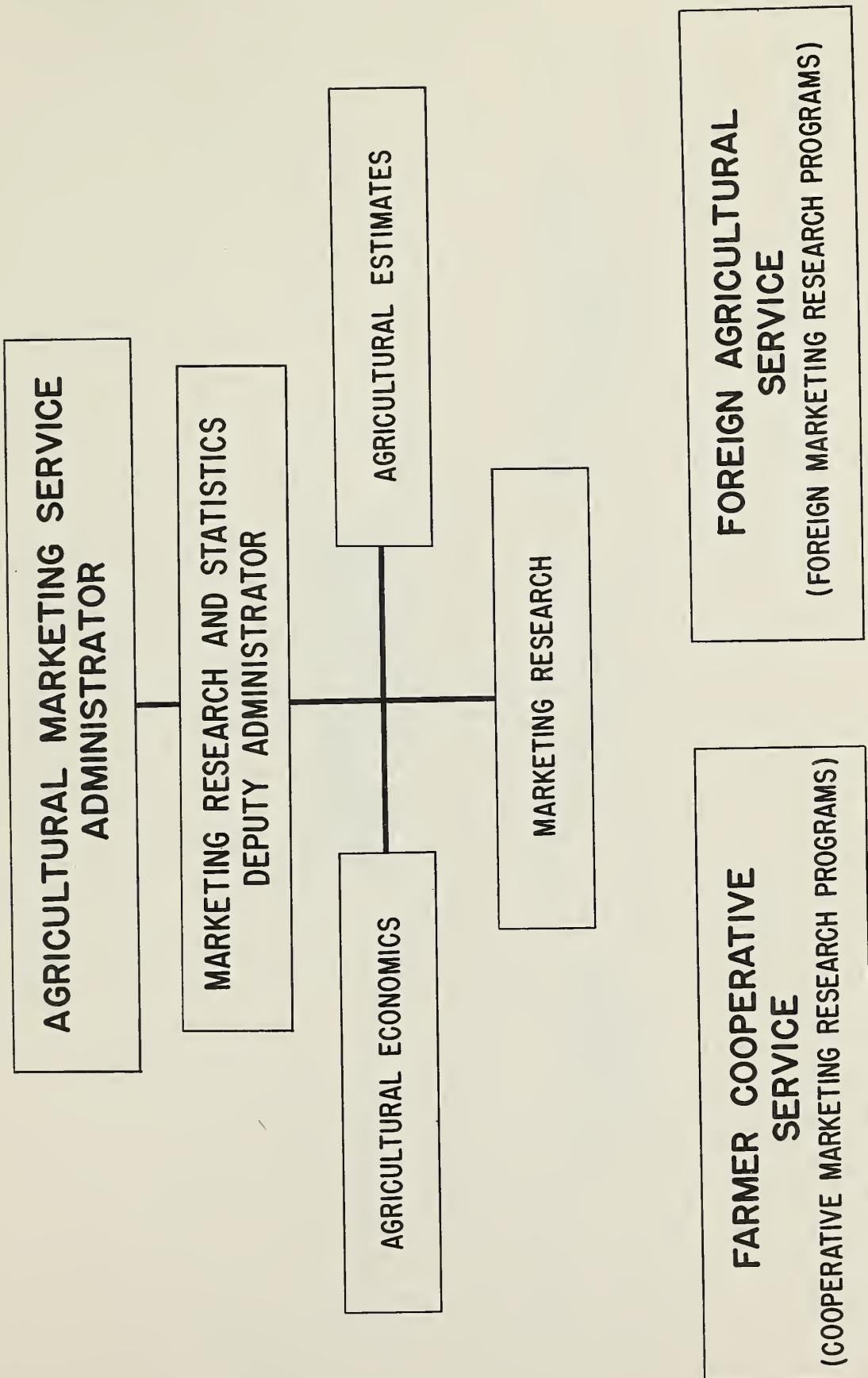
**ASSISTANT CHIEF  
RESEARCH**



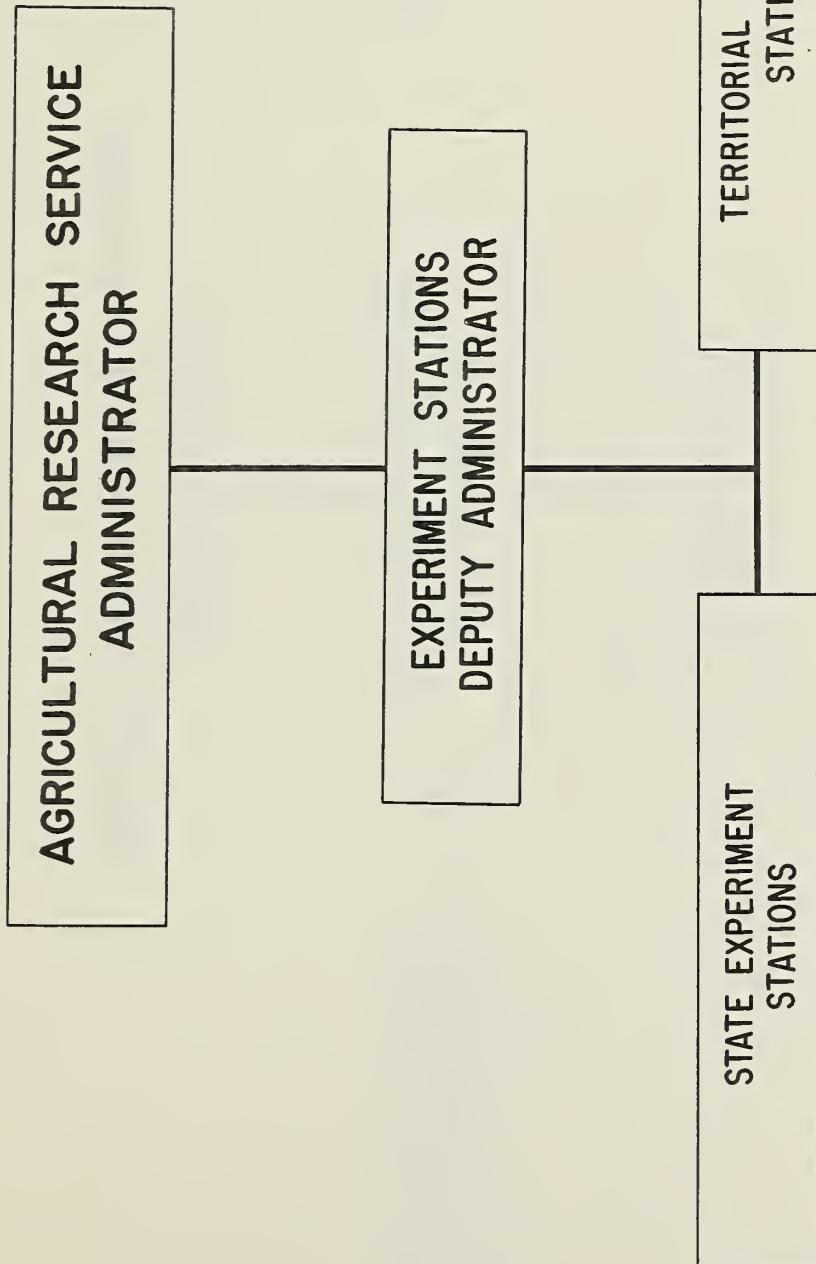
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# MARKETING RESEARCH

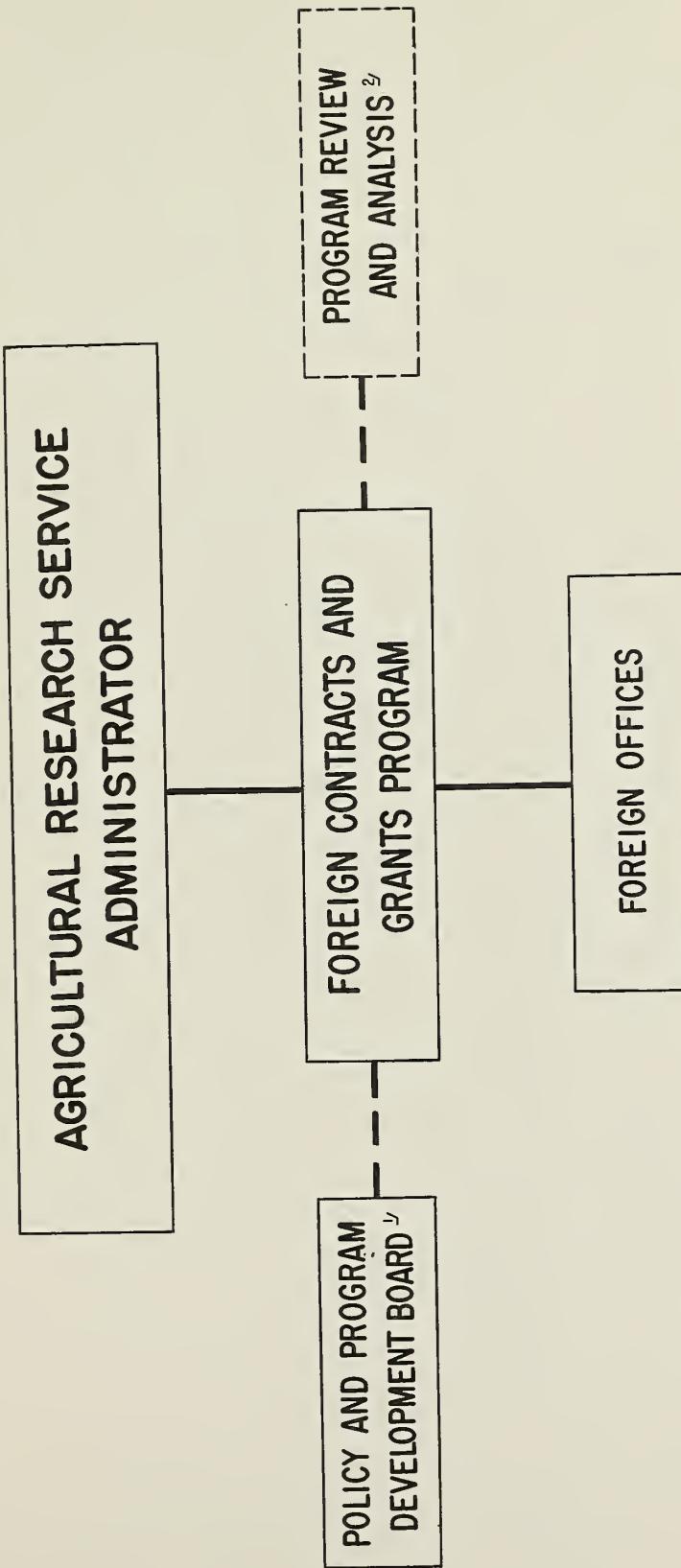






D I V I S I O N S





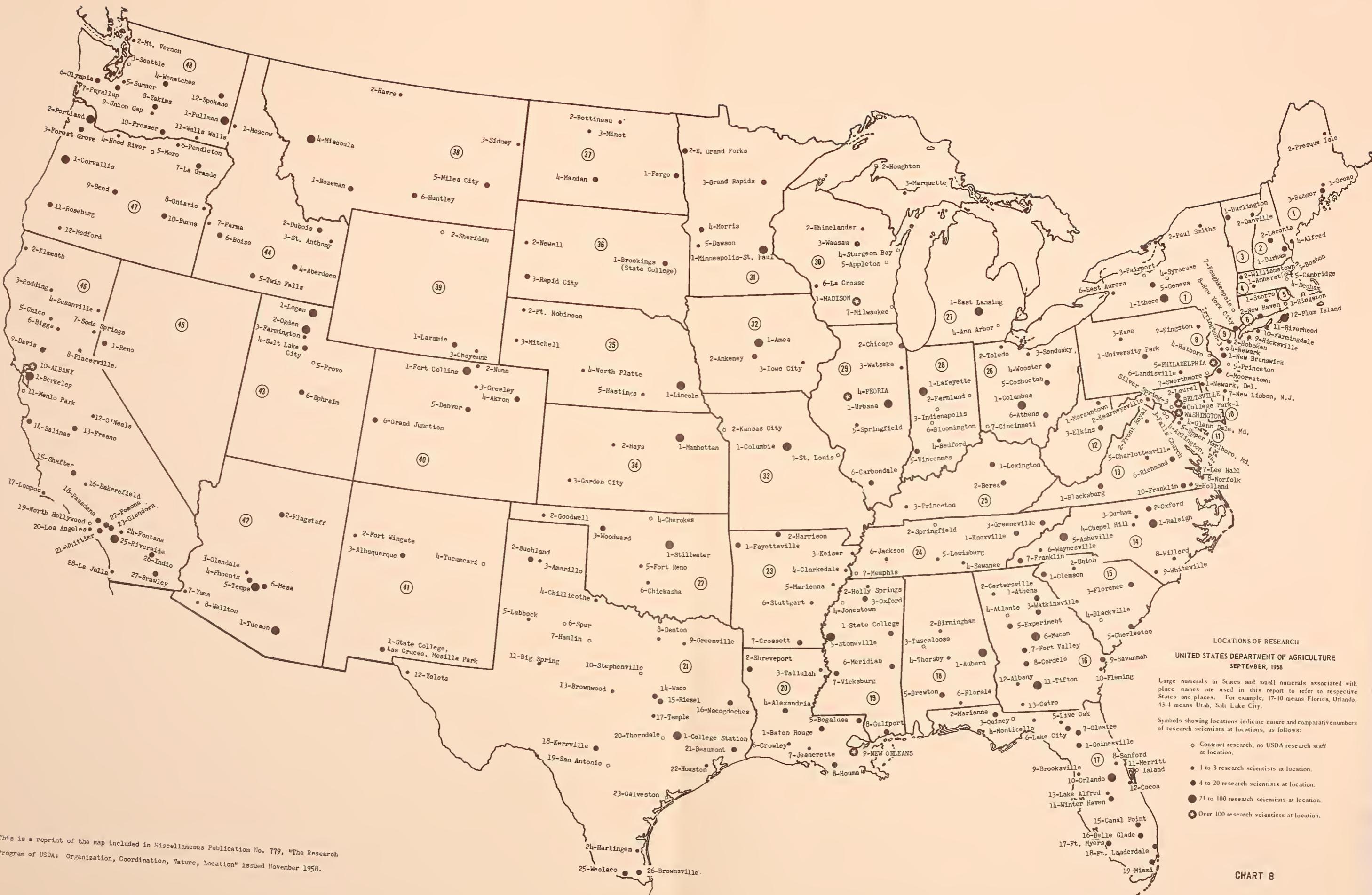
✓ Membership consists of:

Director, Foreign Contracts & Grants Program, ARS  
Deputy Administrator, Farm Research, ARS  
Deputy Administrator, Utilization Research and Development, ARS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Asst Chief, Research, Forest Service  
Deputy Administrator, FAS

✓ Functions performed by:

Deputy Administrator, Farm Research, ARS  
Deputy Administrator, Utilization Research and Development, ARS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Asst Chief, Research, Forest Service  
Act individually within assigned areas of responsibility and collectively  
on projects crossing such areas of responsibility







## UNITED STATES DEPARTMENT OF AGRICULTURE

Estimated Distribution of Appropriations for Research,  
United States Department of Agriculture and the  
State Agricultural Experiment Stations,  
Fiscal Year 1959

(In thousands of dollars)

Research Subject Matter Category	State Agricultural				Total
	USDA	Experiment Stations			
	Agencies	Federal	Non-	grant	
Marketing:	:	:	:	:	:
Foreign .....	\$ 396	- -	- -	\$ 396	
Domestic .....	9,803	\$ 6,074	\$ 4,320	20,197	
New and Expanded Uses for Agricultural Products .....	19,017	1,081	5,076	25,174	
Economics of Production .....	3,206	1,527	2,808	7,541	
Agricultural Engineering .....	2,338	954	3,132	6,424	
Human Nutrition and Home Economics .....	2,184	2,035	3,132	7,351	
Field and Horticultural Crop Production .....	12,000	5,661	30,456	48,117	
Forestry Production .....	11,696	318	1,404	13,418	
Soil and Water Conservation ...	7,099	3,403	11,556	22,058	
Plant Diseases .....	3,208	1,908	6,372	11,488	
Insect Control .....	6,635	1,686	3,888	12,209	
Livestock Production .....	5,385	5,502	29,808	40,695	
Animal Diseases and Parasites ..	6,918	1,655	6,048	14,621	
<u>TOTAL</u> .....	<u>89,885</u>	<u>31,804</u>	<u>108,000</u>	<u>229,689</u>	

NOTE: Based on appropriation structure in 1960 Estimates.

a/ Includes \$5,746,510 estimated to meet pay act and penalty mail costs as follows: ARS, \$4,074,110; AMS, \$584,500; FCS, \$29,000; FS, \$1,003,400; FAS, \$32,000; and LIB, \$23,500.

b/ Includes \$250,000 for penalty mail costs.

## UNITED STATES DEPARTMENT OF AGRICULTURE

Research Funds and Related Personnel, Fiscal Year 1959

	<u>Appropriated Funds</u> (In thousands)	<u>Personnel</u> (as of 12/31/58)
<b>Agricultural Research Service:</b>		
Farm .....	\$43,785	5,992
Utilization .....	16,067	1,689
Home Economics .....	2,164	280
Experiment Stations Programs ..	1,103	138
<b>Total, ARS .....</b>	<b><u>63,119</u></b>	<b><u>8,099</u></b>
<b>Agricultural Marketing Service ..</b>	<b>9,104</b>	<b>981</b>
<b>Forest Service .....</b>	<b>16,526</b>	<b>2,050</b>
<b>Farmer Cooperative Service .....</b>	<b>428</b>	<b>46</b>
<b>Foreign Agricultural Service ....</b>	<b>396</b>	<b>36</b>
<b>Library .....</b>	<b><u>312</u></b>	<b><u>52</u></b>
<b>TOTAL .....</b>	<b><u>89,885</u></b>	<b><u>11,264</u></b>

NOTE: In addition, revised estimate for Foreign Currencies, F. Y. 1959, is \$11,485,081; previous estimate--\$10,500,000.

Eleven employees administering the Foreign Currencies Program are included in totals for ARS, since the costs for such personnel are provided from ARS funds.

UNITED STATES DEPARTMENT OF AGRICULTURE  
ORGANIZATION FOR RESEARCH

RESEARCH AREAS

The United States Department of Agriculture total research program is divided into five major areas: (1) Farm research, (2) Utilization research and development, (3) Home economics research, (4) Forest research, and (5) Marketing research. In addition, we have responsibility for Federal-grant funds appropriated for research at State Experiment Stations, and the new Foreign Contracts and Grants Program conducted under sections 104(a) and 104(k) of Public Law 480.

FARM RESEARCH

Dr. T. C. Byerly, Deputy Administrator for Farm Research, has responsibility for the seven farm research divisions -- Soil and Water Conservation, Crops, Animal Husbandry, Animal Disease and Parasite, Entomology, Agricultural Engineering, and Farm Economics.

Soil and Water Conservation Research Division conducts research to develop systems of soil and water management and conservation that will permit efficient, sustained, and profitable use of the Nation's soil and water resources. It studies soil chemistry and physics, microscopic plant and animal life in the soil, methods of cultivation, irrigation, and crop rotation, factors involved in producing crops of high nutritive value, and soil-water-plant relationships that may affect management of different soils.

Soil and water management and conservation research is also carried on in such fields as watershed hydrology, stream and reservoir sedimentation, runoff, salinity control, and engineering aspects of drainage and irrigation. Fertilizer investigations cover development of new types of fertilizers, more effective ways of manufacturing and using them, field, greenhouse, and laboratory tests for evaluating efficiency of fertilizers, and studies of how plants use applied materials.

Crops Research Division conducts research on field and horticultural plants. Plant research is aimed at developing crops with higher productive efficiency, better quality, and resistance to diseases, insects, heat or cold, and drought.

Through their investigations of plant diseases, research scientists devise practical control measures such as seed treatment, spraying, dusting, and soil fumigation. They also study chemicals used in crop production, including those used for weed control, for treatment of cuttings

to stimulate root formation, for preventing preharvest fruit drops, for blossom thinning, for quick ripening, and for better flavor and nutrition.

This Division handles studies of cereal crops, cotton and other fiber crops, forage and range crops, oilseed and special crops, and tobacco, rubber, and sugar plants. In addition, it investigates the use of cultivation, competitive crops, pasturage, herbicides, and other means for brush and weed control in cultivated crops, pastures, and rangelands.

It conducts studies of deciduous and subtropical fruits and nuts, truck crops, vegetables, potatoes, sweetpotatoes, peanuts, ornamental trees and shrubs, landscaping, and flower crops. It introduces and tests promising foreign seeds and plants for possible domestic use. In addition, the Division conducts research on nematodes and on plant growth, and issues reports on currently prevalent plant diseases.

Animal Husbandry Research Division conducts research on livestock, dairy, and poultry husbandry. It carries on extensive breeding projects to develop superior strains and cross-bred types of beef cattle; strains of hogs with capacity for rapid growth and economy of gain, high fertility, and quality of carcass; types of sheep that are most efficient in producing high-quality meat and wool; strains of chickens and turkeys that excel in egg and meat production; and strains of fur-bearing animals raised in captivity.

The Division investigates the effect of feeding and nutrition variations on animals and poultry. It studies the effect of animal and poultry breeding, feeding, management, age, and sex on the quality of meat, meat and poultry products, wool, fur, and other animal fibers.

In the field of dairy husbandry, the Division carries on research to breed strains of dairy cattle that will have longer periods of usefulness, higher production levels, and better adaptability to specific regions. Research on factors affecting the general economic usefulness of dairy cattle includes studies of dairy feeds and pasturage, animal nutrition, mastitis, sanitary milk production, and physiological aspects of growth, reproduction, infertility, and lactation. Studies are carried on to devise better and more economical feeding methods and to learn how to produce milk of the highest nutritional value.

Animal Disease and Parasite Research Division conducts studies of diseases and parasites that affect domestic animals, fur-bearing animals raised in captivity, and poultry. Disease research involves techniques for diagnosing bacterial, mycotic, viral, rickettsial, and other diseases, studies of chemicals and biologics for combating them, the chemistry and physics of the diseases and ways that the infectious ones are transmitted.

Research on harmful parasites, including protozoa and the helminth parasites, covers investigations of their biology and habits, their effect on animals and poultry, how they are transmitted, diagnostic methods, and the development of practical, effective treatments to eradicate or control these parasites.

Entomology Research Division conducts studies on the biology and habits of insects that are injurious or beneficial to agriculture. It devises methods for destroying, controlling, eradicating, or preventing the spread of the harmful ones and for utilizing the beneficial ones. It studies insects that annoy or affect the health of man or infest human habitations, and develops methods for controlling them.

The Division investigates insecticides as a primary means of insect control, including residual action, methods and equipment for application, and insect resistance to insecticides. Biological, cultural, and other methods of control are examined. It conducts studies to support cooperative Federal-State insect control and survey programs and quarantine activities.

Agricultural Engineering Research Division conducts research on safe and efficient uses of farm power, labor, machines, structures, and materials. It seeks to improve tillage and harvesting farm machinery and equipment, and methods for conditioning and preparing farm products for use or sale. For instance, studies involve ways to dry or condition hay and grains, hull seeds and nuts, and to process fiber crops. It examines income-producing uses of electrical energy on farms, as power or as radiations that may affect plants and animals. The Division also conducts research on farm structures, seeking to design stronger, more economical farm storage and service buildings, better animal housing, and more livable farm homes.

Farm Economics Research Division carries on a national program of economic and statistical research on farm problems involving the economic use of labor, land, buildings, and equipment in farm production, and adjustment in farming to technological development and changing market outlets.

Research on farming efficiency includes studies of farm labor, trends in mechanization and other technological developments, electrification, farm structures, fertilizer and pesticide usage and livestock feeding practices. Research on production, income, and costs involves appraisals of farm output and productivity, studies of costs and returns on important types of farms, and problems of low-production farms and their opportunities for income improvement. Studies of agricultural finance deal with farm credit facilities, financing of farm-living and production, agricultural risk and insurance problems, accident statistics,

and impact of taxation upon individual farmers and agriculture as an industry. Land and water research involves studies of economic use and development of land and water resources, and analyses of farm real estate values, land income, land tenure problems, and farm leasing.

#### UTILIZATION RESEARCH AND DEVELOPMENT

Dr. George W. Irving, Jr., is the Deputy Administrator for Utilization Research and Development. There are four divisions conducting research and development on utilization problems of national scope to agriculture and industry with particular interest on commodities of their respective producing areas.

Northern Utilization Research and Development Division, with headquarters at Peoria, Illinois, conducts research and development on farm commodities with special emphasis on those of the northern producing area, including corn, wheat, and other cereal crops; soybeans and other oilseed crops, and new crops which could profitably replace those in surplus.

Southern Utilization Research and Development Division, with headquarters at New Orleans, Louisiana, and field stations at Raleigh, North Carolina; Olustee and Winter Haven, Florida; Weslaco, Texas; and Bogalusa, Louisiana; conducts research and development on farm commodities with special emphasis on those of the southern producing area, including cotton, rice, citrus and other fruits, vegetables, sugarcane, the oilseeds -- cottonseed, peanuts and tung -- and pine gum, turpentine, and rosin.

Eastern Utilization Research and Development Division, with headquarters at Philadelphia, Pennsylvania, conducts research and development on farm commodities with special emphasis on those of the eastern producing area, including apples and other deciduous fruits, potatoes and other vegetables, tobacco, dairy products, meat, animal fats, hides, tanning materials and leather, honey, maple products, plant steroids, biologically active plant compounds and on the allergens of agricultural products.

Western Utilization Research and Development Division, with headquarters at Albany, California, and field stations at Pasadena, California, and at Puyallup and Pullman, Washington, conducts research and development on farm commodities with special emphasis on those of the western producing area, including alfalfa and other forage crops, deciduous and citrus fruits, vegetables, poultry, eggs, wheat and rice, wool and mohair, and sugar beets.

#### INSTITUTE OF HOME ECONOMICS

Dr. Hazel K. Stiebeling, Director of the Institute of Home Economics, is responsible for the work of the three research divisions -- Clothing and Housing, Household Economics, and Human Nutrition.

Clothing and Housing Research Division conducts studies on the quality and utility of fabrics, clothing, and household textile articles for different household purposes. The Division also explores the kinds and characteristics of housing and household equipment needed to meet family requirements for efficient housekeeping and comfortable living. It develops information basic to wise planning for, and the improved use, and care of clothing, household textiles, the house, its equipment, and its facilities.

Household Economics Research Division investigates levels of food consumption and nutritive value and economy of customary diets of various population groups. Research is also conducted on patterns of rural family expenditures, household production for family use, and economic problems of household management, including the effect of the economic situation on family living. The Division applies economic and other scientific information to develop recommendations for effective and economical use of food and other family resources for higher levels of living. For example, the Division prepares food plans to help families get the best possible nutritive returns from their food purchases. It cooperates with other Federal and State agencies in the coordination of nutrition programs.

Human Nutrition Research Division conducts research on the composition and nutritive value of foods; human nutritional requirements and the body's response to nutrients, foods, and diets when eaten in varying amounts and proportions; cooking quality and utility of foods and factors that affect these; and the development of improved procedures and conditions for household processing and storage of foods. Research on home food preparation develops new and improved cooking methods for use in homes and institutions, to preserve nutritive values and to make use of abundant or new food on the market.

#### FORESTRY RESEARCH

An Assistant Chief of the Forest Service, Dr. V. L. Harper, has responsibility for the planning and execution of research in the eight research divisions--Forest Management, Range Management and Wildlife Habitat, Watershed Management, Forest Products Utilization, Forest Economics, Forest Fire, Forest Insect, and Forest Disease.

Forest Management Research Division is concerned with production and management of timber crops through genetics and breeding for trees of superior wood quality and pest resistance, improved planting practices, measurement of timber volumes and growth for sustained yield, better understanding of tree growth-processes, naval stores production, and cultural practices to insure optimum development and natural regeneration of timber stands. Much of this research is done in cooperation with State agencies, individuals and industrial landowners.

Range Management and Wildlife Habitat Research Division deals with improved management of natural and seeded ranges associated with forest lands to promote optimum forage yields for livestock without damage to watershed values; modification of timber management and other special measures required to promote cover and food for big game and other wildlife; and forest land management practices for campgrounds and other facilities of forest recreation. Individuals and State agencies cooperate with the Division on this research.

Watershed Management Research Division emphasizes research to improve forest soils management for production of forest crops; basic studies in forest-soil-plant water relations; and research in watershed management to develop efficient methods of rehabilitating damaged watersheds, protecting soil and water resources under various uses of forest and related range lands, and increasing yields of usable water from mountain watersheds by vegetation modification, snowpack management, and other means. Cooperators on this program of research include municipal, State, and Federal Agencies.

Forest Products Utilization Research Division develops new uses and products from wood and its components; improves serviceability of wood and wood-derived products by better processing methods, preservatives, and structural designs; develops more efficient and less costly methods of manufacturing wood products and wood-derived materials; and devises improved equipment for producing, protecting, and harvesting forest crops and their primary processing. Industry and other Federal agencies strengthen this research by their cooperation.

Forest Economics Research Division carries on a continuing survey of the Nation's forest resources including estimates of current and future requirements for forest products and timber production; marketing research to improve the returns to forest landowners and to better serve the processor and consumer; forest production economics studies involving taxation, costs and returns, multiple use of forest land and alternative management policies and practices. Valuable cooperative effort is provided by States and forest industries.

Forest Fire Research Division is concerned with improving fire prevention and control through studies of preventing lightning fires by thundercloud modification, prevention of man-caused fires, behavior of free-burning fires in relation to fuels and weather, control of fires by improved ground and aerial attack methods, and the techniques for using fire for beneficial purposes. Considerable cooperative assistance on this research is given by State foresters, Federal agencies, and a research foundation.

Forest Insects Research Division deals with improved prevention and control of outbreaks of destructive insects which attack forests; studies of life histories and habits of forest insects; development of methods of preventing epidemics through biological factors and silvicultural practices; and improvement of control measures using chemicals applied by aerial and ground methods. Cooperative efforts by State agencies and private land owners contribute to this work.

Forest Disease Research Division investigates the identities and life histories of forest tree pathogens, the conditions leading to epidemics, how diseases may be prevented through silvicultural or nursery practices, and methods of control through chemical, mechanical, and biological means. This research receives extensive cooperative effort from Federal and State agencies and forest landowners.

#### **MARKETING RESEARCH**

Marketing research is located in the Agricultural Marketing Service. A Deputy Administrator, Dr. Omer W. Herrmann, has responsibility for research done primarily in three Agricultural Marketing Service Divisions -- Agricultural Economics, Agricultural Estimates, and Marketing Research.

Agricultural Economics Division conducts research and analysis on the current situation and outlook for demand, supply, prices, and incomes in agriculture. Research on farm population and rural life is part of its basic economic research program. The Division also issues a series of "analytical" reports during the year covering the demand and supply situation for all major farm commodities. This research and analysis work is the basis of the nationwide Outlook service to farmers, carried on jointly with the Federal-State Extension Service. The Division also provides special analyses, on request.

Agricultural Estimates Division provides the Nation's basic information on crop and livestock production, farmers prices, and farm employment and wage rates. The Crop Reporting Board reports and other reports totaling over 500 during the year provide data and estimates for the

Nation, and by individual States. These data are provided through 41 State offices covering all States. The program is based on Federal-State cooperation.

Marketing Research Division conducts a broad program designed to expand market outlets for farm products. It is directed toward improvements in efficiency of marketing, reduction of marketing costs, quality improvement, and market development. Much of research in this Division is carried on in cooperation with private industry and the State Experiment Stations.

In addition, specialized marketing research dealing with problems of farmers' cooperatives is conducted in the Farmer Cooperative Service. Research on foreign markets and competition is conducted in the Foreign Agricultural Service. In both of these agencies, the amount of research is relatively small, and the Administrators -- Dr. Knapp and Dr. Myers -- are responsible for planning and carrying out the work.

The above descriptions represent the Department's regular research programs, including research done under contract by domestic organizations outside the Department. In addition, we have two other research programs for which we have administrative responsibility.

#### EXPERIMENT STATIONS

Dr. E. C. Elting, Deputy Administrator for Experiment Stations, has responsibility for the activities of the two Divisions -- the State Experiment Stations Division and the Territorial Experiment Stations Division.

State Experiment Stations Division administers Federal funds, provided by the Hatch Act, as amended in 1955, for the support of research in agriculture, the rural home, and rural life by experiment stations in the several States and in Hawaii, Puerto Rico, and the State of Alaska. Administration of the acts granting funds to States and Territories involves supervision of the funds, close advisory relations with the stations as to research for which the funds are expended, annual examination of the work and expenditures of each station to ascertain compliance with the several Federal-grant acts, assistance to the State stations in planning and coordination of programs for cooperative research, and assistance to Federal agencies in planning cooperation with the States.

In addition, the Division has responsibility for leadership in planning and coordinating the cooperative regional research as authorized under the 1946 amendment to the Bankhead-Jones Act. More than 70 cooperative regional research projects are now in operation. These involve participation of all State agricultural experiment stations and virtually all research agencies of the Department.

Territorial Experiment Stations Division administers programs in Puerto Rico, the Virgin Islands, and the State of Alaska.

The Federal experiment station in Puerto Rico serves as an outpost of the Department for conduct of agricultural research in the Tropics. The station also conducts research aimed at increasing the production of agricultural crops of value to the United States and improving practices to make the growing of tropical crops of greater economic benefit to the people of Puerto Rico.

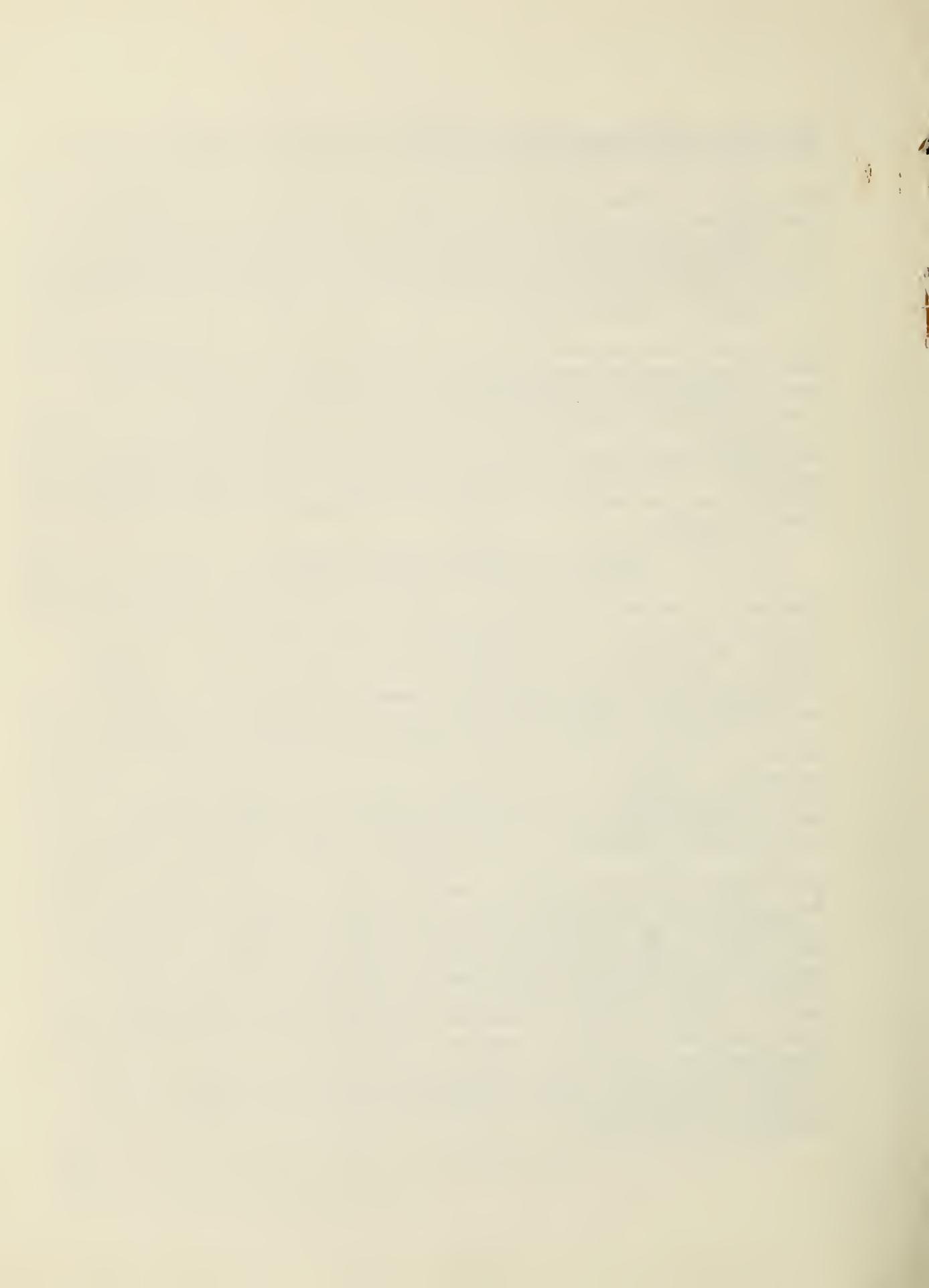
The Division has responsibility for operation of an agricultural research and extension program in the Virgin Islands. It is directed toward development and dissemination of agricultural information of direct benefit to farmers and rural people in the Islands.

The Division also carries out a joint program with the agricultural experiment station of the University of Alaska. The program is aimed primarily at increasing the volume and efficiency of crop and live-stock production.

#### FOREIGN CONTRACTS AND GRANTS PROGRAM

The Foreign Contracts and Grants research program covers all fields of Department interest and is administered by a Director, Dr. G. E. Hilbert who reports to the Administrator of the Agricultural Research Service. This program was authorized under section 104(a) and 104(k) of Public Law 480, 83rd Congress, as amended. Research is conducted under grants and contracts in foreign countries from foreign currencies resulting from the sale of surplus agricultural commodities. Grants and contracts are entered into with foreign institutions having scientific personnel with specialized experience and facilities to carry out a program of farm, utilization, home economics, forestry, and marketing research. We have one field office established in Rome, and two additional ones are planned for Asia and South America.

The Director has administrative responsibility for the program and, with his foreign offices, administers all research agreements with foreign institutions. He receives guidance from a Policy and Program Development Board, composed of deputy administrators for research in Agricultural Research Service, Agricultural Marketing Service, and Forest Service, plus the deputy administrator of the Foreign Agricultural Service. Review, analysis, and recommendations regarding proposed and going research projects overseas are the responsibility of the deputy administrators for research. They determine whether proposals are in conformity with the criteria established for foreign research of interest to their particular research program and whether satisfactory progress is being made.



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U. S. DEPARTMENT OF AGRICULTURE  
Office of the Secretary

BETTER FORESTRY FOR A BETTER FUTURE

Mr. Chairman, distinguished guests, members of the Fifth World Forestry Congress. Very shortly the official sessions of this Congress will come to a close. We who are your hosts, the United States Government, reflecting the views of the people of America, are greatly appreciative that you chose to come to our country for your meeting. We are honored by your presence. We hope sincerely that each of you have enjoyed your visit; that your experiences have been pleasant; that from the deliberations of this Congress you have profited; that you will come again.

Each of the four previous World Forestry Congresses has made a great contribution toward enlarging the fund of human knowledge encompassed within the term "Forestry." This fifth Congress is no less impressive. Here are assembled together more than 2000 men and women representing more than 60 countries. It may be assumed that together you represent the sum total of human knowledge concerned with forestry. You have been brought together by bonds of common interest wrought out of your past experiences and your present responsibilities. Through the exchanges here in which you have participated you have shared your knowledge in order that it might become more universal. No doubt, too, you have sought to further extend, or to find ways to further extend, the frontiers of existing knowledge so that the forests and forest lands of our Earth may be more fruitful of value to all peoples everywhere.

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Closing address by Assistant Secretary E. L. Peterson before the Fifth World Forestry Congress, September 10, 1960, 10:00 a.m., Seattle, Washington.



The very theme of this Congress -- Multiple Use of Forest Lands -- indicates an awareness of the great potential of forests to provide a multiplicity of values, both tangible and intangible, to serve not only the physical needs of man but to ennable his spirit as well. Perhaps as we seek more effectual means to use for the benefit of all people everywhere the products and values of the forests of the world without impairing the ability of these forests to continue to provide those values to succeeding generations, we can even find a way to communicate among all men of all nations an appreciation of the values of individual human dignity which attaches to and is a part of every man everywhere. For is not the objective of human endeavor to so satisfy the physical needs of people that they are free to attain the maximum of their own individual capacities? And is not such attainment most effectively and fruitfully expressed in service to their fellows? Is not this the way to so extend the fund of man's knowledge that the needs of all men are satisfied? Is this not what you are really doing through the exchanges of this World Forestry Congress? Is this not your purpose? For what other purpose do you seek to improve forestry? Why do we seek more efficient and more productive ways to use our present forests and at the same time replace those we use with better ones? If forestry is to be a creative science how can it do so without creative minds, for whatever is used and recreated must reflect the application of human effort?

I am persuaded that in conferences such as this is laid not only the basis for the forestry of the future but also the basis for understanding among people. Here there has been a free and easy exchange of knowledge.



In the halls of this venerable University, dedicated to extending the scope and capacity of individual human intellects, friendships have formed between many of you as individuals, respect for each other has been evidenced, and more importantly, together you have sought truth. In doing so each has benefitted. If one truth -- one new piece of dependable knowledge has been acquired -- then you are free to move a step farther in pushing outward the endless frontier of knowledge that your possession of it may grow -- and thus do you and I and all of us grow.

Also you have seen here something of the United States of America. You have no doubt met or visited some American families -- families like your own -- with hopes and aspirations for a fuller life for themselves -- for their children -- for their grandchildren. We hope you take some of the spirit of America with you when you leave, for our origins are universal -- our citizens have their National origins in every country of the world. In this sense we owe much to many cultures. We seek not to impose anything American upon anyone anywhere; we would hope to share with you that which you may find of value to you.

Many of you have taken pre-Congress and in-Congress forestry tours. Many more of you are scheduled to take post-Congress tours when you leave here. As your hosts, we the American people have done and will do our best to show you our country, our forests, our forest industries, research installations, forestry institutes and our homes. We hope that these tours are up to your expectations and that you will long remember America and her warm hearted people.



During the 13 days of sessions at the Congress, you communicated with each other in three different languages to paint the broad picture of forestry as it looks in the world today. It is an impressive picture. It is especially significant because it is the composite product of more than 2000 forestry leaders representing every geographical region of the earth. Painted with one and one-half million carefully chosen words this product of the Fifth World Forestry Congress has caught the attention of the world. It has dramatized forestry and the part that foresters can and hope to play in meeting one of the great challenges of our times -- the pressure of people upon the forest resources.

You have met, head on, the questions: "What is the best way to produce more and better products from the forest? How do we make wiser, lasting use of what we already have? And most important of all, how do we keep pace with the forest resource needs of the world's growing population?" You have discussed the part that Multiple Use of Forest Lands must and will play in solving this problem and have undoubtedly formed your own conclusion on how best to apply this concept in your native land.

This is as it should be, for I feel it safe to say that most of you carry today, on your shoulders the responsibility for using your forest resource to make a better life for your people, their children, and for generations yet unborn. I feel certain that you will do your best to put to work, in behalf of your people, the great wealth of knowledge that has been presented here. As you leave this hall, our best wishes go with you for your success in this noble endeavor.



In the years to come, some of what has been said here at the Fifth World Forestry Congress may be forgotten. But I feel certain that the United States, a nation principally composed of immigrants and their descendants from every country on this globe, will long remember you. For on this University of Washington campus you have helped give root to the International Friendship Grove. As these trees, which your hands have helped plant, thrive and grow, they will be an everlasting reminder to all who see them that here, at the Fifth World Forestry Congress, the foresters of the world did understand each other, did freely communicate with each other, and did work side by side as friends. May this grove be another stepping stone, however small, in the world's movement toward peace and freedom.

With you, the forestry leaders of the world, rest the fate of a resource which covers one-third of the earth's surface. A resource of this magnitude must be carefully tended and kept in the service of mankind. Properly managed, the forest resource can be perpetually renewed; improperly used, it can be destroyed.

Your presence here has helped make brighter the future of world forestry. It has helped call attention to the world the fact that forestry and forest resources are important; that they deserve serious and continuing attention; and that they can and should be a major factor in raising the standard of living of the people who populate the earth. All this is important in man's determined move toward a world more satisfying and meaningful in terms of human comfort, personal dignity, and unfettered communication with his fellows.



I know that I speak for the American people when I say, "We are glad you came." Your visit to our country will be long remembered by us, especially by those thousands of Americans whom you have personally met. You have made a good impression on us; we hope that we have made a good impression on you. The world is richer because of the Fifth World Forestry Congress. May you carry in your hearts the spirit of this Congress, and in your minds a determination that the forests of the world shall perpetually serve the people of the world.

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U. S. DEPARTMENT OF AGRICULTURE  
Office of the Secretary

BETTER FORESTRY FOR A BETTER FUTURE

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In the halls of this venerable University, dedicated to extending the scope and capacity of individual human intellects, friendships have formed between many of you as individuals, respect for each other has been evidenced, and more importantly, together you have sought truth. In doing so each has benefitted. If one truth -- one new piece of dependable knowledge has been acquired -- then you are free to move a step farther in pushing outward the endless frontier of knowledge that your possession of it may grow -- and thus do you and I and all of us grow.

Also you have seen here something of the United States of America. You have no doubt met or visited some American families -- families like your own -- with hopes and aspirations for a fuller life for themselves -- for their children -- for their grandchildren. We hope you take some of the spirit of America with you when you leave, for our origins are universal -- our citizens have their National origins in every country of the world. In this sense we owe much to many cultures. We seek not to impose anything American upon anyone anywhere; we would hope to share with you that which you may find of value to you.

Many of you have taken pre-Congress and in-Congress forestry tours. Many more of you are scheduled to take post-Congress tours when you leave here. As your hosts, we the American people have done and will do our best to show you our country, our forests, our forest industries, research installations, forestry institutes and our homes. We hope that these tours are up to your expectations and that you will long remember America and her warm hearted people.



During the 13 days of sessions at the Congress, you communicated with each other in three different languages to paint the broad picture of forestry as it looks in the world today. It is an impressive picture. It is especially significant because it is the composite product of more than 2000 forestry leaders representing every geographical region of the earth. Painted with one and one-half million carefully chosen words this product of the Fifth World Forestry Congress has caught the attention of the world. It has dramatized forestry and the part that foresters can and hope to play in meeting one of the great challenges of our times -- the pressure of people upon the forest resources.

You have met, head on, the questions: "What is the best way to produce more and better products from the forest? How do we make wiser, lasting use of what we already have? And most important of all, how do we keep pace with the forest resource needs of the world's growing population?" You have discussed the part that Multiple Use of Forest Lands must and will play in solving this problem and have undoubtedly formed your own conclusion on how best to apply this concept in your native land.

This is as it should be, for I feel it safe to say that most of you carry today, on your shoulders the responsibility for using your forest resource to make a better life for your people, their children, and for generations yet unborn. I feel certain that you will do your best to put to work, in behalf of your people, the great wealth of knowledge that has been presented here. As you leave this hall, our best wishes go with you for your success in this noble endeavor.



In the years to come, some of what has been said here at the Fifth World Forestry Congress may be forgotten. But I feel certain that the United States, a nation principally composed of immigrants and their descendants from every country on this globe, will long remember you. For on this University of Washington campus you have helped give root to the International Friendship Grove. As these trees, which your hands have helped plant, thrive and grow, they will be an everlasting reminder to all who see them that here, at the Fifth World Forestry Congress, the foresters of the world did understand each other, did freely communicate with each other, and did work side by side as friends. May this grove be another stepping stone, however small, in the world's movement toward peace and freedom.

With you, the forestry leaders of the world, rest the fate of a resource which covers one-third of the earth's surface. A resource of this magnitude must be carefully tended and kept in the service of mankind. Properly managed, the forest resource can be perpetually renewed; improperly used, it can be destroyed.

Your presence here has helped make brighter the future of world forestry. It has helped call attention to the world the fact that forestry and forest resources are important; that they deserve serious and continuing attention; and that they can and should be a major factor in raising the standard of living of the people who populate the earth. All this is important in man's determined move toward a world more satisfying and meaningful in terms of human comfort, personal dignity, and unfettered communication with his fellows.



I know that I speak for the American people when I say, "We are glad you came." Your visit to our country will be long remembered by us, especially by those thousands of Americans whom you have personally met. You have made a good impression on us; we hope that we have made a good impression on you. The world is richer because of the Fifth World Forestry Congress. May you carry in your hearts the spirit of this Congress, and in your minds a determination that the forests of the world shall perpetually serve the people of the world.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Statement of E. L. Peterson, Assistant Secretary of Agriculture, before the House Committee on Agriculture, June 24, 1960

Mr. Chairman and Members of the Committee:

I appreciate the opportunity of presenting the views of the Department of Agriculture regarding the identical Bills H.R.12182 introduced by Congressman Poage, and H.R.12184 introduced by Congressman Short, Bills to protect farm and ranch operators making certain land use changes under the Great Plains Conservation Program against loss of acreage allotments. Senator Young of North Dakota introduced an identical Bill, S-3533, and subsequently offered the text of that Bill as an amendment to S-2759, the Wheat Bill, which amendment was adopted without opposition and appears as Title III in that Bill as passed by the Senate.

The Department of Agriculture recommends that the Bill H.R.12182 be enacted for the reason that it will be an important contribution toward accomplishing the long-term objectives of the Great Plains Conservation Program.

As this Committee is well aware, the principal objective of the Great Plains Conservation Program is to bring about greater agricultural stability in the Great Plains region through intensification of soil and water conservation measures and through encouragement of needed land use adjustments. The fluctuating rainfall pattern in the Great Plains has, from time to time, coincided with extensive cultivation of substandard soils to produce "dust bowl" conditions felt throughout the Nation in the form of both physical and economic distress.



One of the most needed adjustments is the development of ranches and farms so they will have greatest chance of economic survival during the long unpredictable periods of low rainfall. This means first of all that plans for management must provide for maximum conservation of moisture and provision for livestock water. Equally as important, it means that land not suited to cropping be devoted to permanent vegetation.

Substantial adjustments are being made in this direction. On more than 4,000 farms and ranches with Great Plains Conservation contracts, about 30 percent of the land formerly in crops is being diverted to permanent grass.

Public Law 1021, which authorizes the Great Plains Conservation Program, makes provision for protecting the crop allotments on the cooperating farms during the period of the contract which runs for periods of from 3 to 10 years. At the termination of these contracts, however, farmers will have to again increase their acres devoted to crops if they are to maintain these acreage allotments.

H. R. 12182 would amend Section 16(b) of the Soil Conservation and Domestic Allotment Act to extend acreage allotment protection for participants in the Great Plains Conservation Program beyond the date of termination of the contract for an additional period equal to the period of the contract. No additional cost to the Federal Government would be imposed by this amendment.



We believe this additional time period for protection of acreage allotment would contribute substantially to maintaining more of the diverted cropland in permanent grass. It will give an additional period for a new system of management under a complete conservation plan to become more fully established and to prove its value. It will provide a longer period of time for each cooperating farmer or rancher to achieve the full benefits of the new conservation farming system and will extend the period of time when he must make a decision about shifting his diverted grassland back to crops to protect his acreage allotment.

Thank you for this opportunity to provide further explanation of our endorsement. We shall be happy to provide further information or attempt to answer questions that Members may have.



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S. DEPARTMENT OF AGRICULTURE  
Office of the Secretary

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FEDERAL-STATES RELATIONS IN RESEARCH

Within recent weeks and days science and its capabilities have come to the forefront of the public mind and conscience. Research is the vehicle of science. Ideas -- concepts -- wrought within the minds of men are its motive power.

From time's beginning man has sought first to understand his environment -- then to modify and control it. Present systems of knowledge are the record of his efforts. This knowledge has been used and applied both to make men free and make them slaves. Both situations have resulted from the political institutions within the framework of which science has been applied.

On the one hand, men control both themselves and this ever-increasing fund of knowledge which comes from their further penetration of the frontiers of science.

On the other hand, supple masters of political intrigue, ignoring intellect, have conjured emotions which cause men to deny themselves.

Thus we find a divided world, but one in which the language of science is universal. Whether men shall use science to destroy themselves or, from intellect, finally find the way for all men to live in harmony and accord, is a question yet to be resolved.

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Address by Assistant Secretary of Agriculture Ervin L. Peterson before the Experiment Station Section, 71st Annual Meeting of the American Association of Land-Grant Colleges and State Universities, Denver, Colorado, 2:30 p.m., MST, November 13, 1957.

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It is now for us who value the way of peace -- who believe that man has an individual dignity conferred by God, his Creator, which no other man may deny -- to generate the energies necessary to assure that intellect -- not scientific achievement alone -- controls man's destiny.

Nowhere in history has science and its accompanying technology more clearly demonstrated its creative value for human welfare than here in America. And in no phase of our national life is this more clear than in agriculture.

Research and education have provided a constantly enlarging science and technology which applied have freed the people of this Nation from bondage to the land and created an abundance heretofore unknown in the history of man.

The American agricultural revolution had its birth in the events associated with the creation of the unique system of higher education, which is the Land-Grant College and University System, and the U. S. Department of Agriculture. These institutions, and this great service arm of Government, have progressed together. Their association remains close and cordial.

We who are a part of the U. S. Department of Agriculture place high value on this close working relationship. It has been, and will continue to be, of great good for rural America and all America.

Our present relations have developed from our mutual experiences. They are founded upon mutual trust, confidence, and respect. We recognize full well that the real strength of agricultural research is in the Land-Grant institutions.



In them the student is first introduced to the several disciplines which constitute the scientists' arsenal. From the classrooms, the research laboratories, the field stations of these institutions, comes the manpower, the new and fresh concepts and ideas, which make scientific progress possible.

We recognize that the Federal Government cannot, and should not, assume full responsibility for agricultural research. Rather, the application of scientific knowledge to the problems of agriculture should be made where the problems are.

A major portion of those problems are in the States, their rural areas, and on the farms and ranches of the country. Moreover, the Land-Grant College or University is closer to the people and their problems. It is more accessible to them.

However, we also recognize, as you do, that there are problems facing the agricultural sector of our economy which are common to all of it. For this reason we in Federal research have a responsibility to provide a national competency in agricultural research adequate to attack those problems. Both in our Federal and State research and in our cooperative research we must also provide supporting service -- provide new knowledge as required -- to enable agricultural education -- the Federal-State cooperative Extension Service -- to bring to rural people the factual information necessary to intelligent decision making, and to achieve effective use of their resources of land, labor, and other assets to enable them to continuously improve their level of living.



Currently we have agricultural abundance. There is every indication that this abundance will endure into the foreseeable future.

In the light of this circumstance we hear questions raised as to why research should be supported, even at current levels, let alone be enlarged. From other sources it is asserted that research should be redirected, that it should undertake a solution to the problems of abundance.

It is asserted that a large enough research program directed at the general area of utilization could produce industrial outlets, other new and enlarged markets, and new crops, which would permit a fuller use of agriculture's resources and use of the technology and science which thus far has been developed and applied to the production and marketing processes in agriculture.

In the light of these circumstances, it seems to me that research has a problem in achieving broad public understanding of what research is, what it has done, and what it is capable of doing.

Clearly, the benefits of agricultural research have been benefits to all the Nation, and in a measure to all the world. The consuming public now has available at all seasons of the year, and in every part of the country, a variety and quality of food stuffs never heretofore known by this or any other Nation. Research, science, and technology, have made this possible. New discoveries in the field of production quickly translate themselves into consumer benefits.

All of us have a responsibility to see that these facts have general public recognition. We also have a responsibility to prevent research becoming the dumping ground for problems created by mistaken public policy.



Certainly research can help answer some of the problems that stem from abundance, from loss of markets for farmers to non-agricultural commodities, from the abuse of our physical resources which in some areas have in part stemmed from incentive pricing continued beyond the need for it.

As our population grows, and it is growing most rapidly, more and more people will become dependent for their food, fiber, and other materials, upon a very small portion of our population constituted by our farmers and ranchers. The farm and ranch enterprise has become characterized by high capital investment, increasing use of off-farm services, higher cash operating costs, narrowing margins between profit and loss.

In the light of these developments, both research and education have an increasing workload to conduct the economic analysis, and provide factual information by which the farmer may be aided in his management decisions. Were I to evaluate the components of an agricultural research program, in the light of current conditions, I would list its elements as containing:

(1) A strong program of basic research, built around pioneering research groups, where, in given research areas, a group of disciplines could be applied together to further penetrate and expand the frontier of human knowledge.

(2) The research program should seek to relate farm production to consumer preferences, nutritional requirements and shifts in population component.



(3) Research should seek ways and means of shortening the distance between the farm gate and the city dinner table.

(4) It should seek methods for more effective use of food to achieve human vigor and health.

(5) It should fully evaluate the economics of alternative land uses.

(6) It should broaden the base of economic research to provide wider and deeper basic information as supporting bases for agricultural policies and programs.

(7) It should investigate vigorously new uses for all types of agricultural production and, particularly, industrial uses for that portion of agricultural production presently in excess of need and likely to continue, into the intermediate term at least, as being excess to need.

(8) A research program must include a strong area of activity to provide protection to our animals and crops from the ravages of plant and animal pests and diseases, and afford the means to quickly attack these diseases or pests when they do occur.

(9) A research program should provide the means to evaluate soil, plant, and water relationships, together with the technical knowledge to permit use of our lands without their physical deterioration.

These elements of a research program are not all inclusive. There may be others which should be added, but these to my mind should be a part of research. In some measure, they are a part of our present research program. The question before research administrators is largely one of where emphasis should be placed.



But a research program, no matter how well put together, is not by itself enough. It requires competent scientists, adequately compensated, with an organizational structure which provides means for their recognition both as administrators and for their scientific accomplishments. It requires physical facilities, equipment, and supporting services, to assure the maximum productivity by each professional individual.

We do not have all of these things. They must be provided as fast as it is possible to do so. The accomplishments of science are not usually immediate. We must build now for what we will require 10, 20, 30 years from now. If we are to build and build soundly, I say again it will require broader public understanding of the place which research has in agriculture, and the significance of agricultural research to the National strength and welfare. It will require also that increasing numbers of students seek careers in research, in the scientific disciplines.

The modern scientist also needs to relate his area of activity to the several areas with which he is associated.

Today's problems do not lend themselves to being catalogued into neat niches. Each is of many facets. We deal not with single problems, but with problem complexes. We must be intelligent enough to provide the type of scientific organization, and the type of scientific training, which will make effective scientists and effective use of scientists in this modern, complex, and rapidly changing world.

All change is put in motion by an idea. Ideas are fleeting. We must create conditions which generate ideas and which put them to work for human betterment.



All of these things are a part of the task in which we of the U. S. Department of Agriculture and you of the Land-Grant College System are mutually engaged. We believe in this system. It has demonstrated both its workability and its worth. We believe it to be capable of undertaking any tasks new or an enlargement of those we now have, within the areas of its competency and delivering full value for the public support upon which it rests.

Now, personally, let me say that I have enjoyed and appreciated the cordial working relations which exist between the Department of Agriculture, its research organization, and the Land-Grant Colleges and Universities, their Experiment Station Directors, and associated personnel.

During the past two years we have been developing ways and means of improving our channels of communication and keeping each other informed concerning all areas of mutual interest. None of us, I am sure, would assert that our communication system is perfect, but on the basis of mutual respect, confidence and trust, belief in each other, and in this great system of which we are a part, we will continue our close working relationships and further perfect our operating relations.

We will continue to resolve such problems as arise by discussing them as we have in the past, frankly and openly around the conference table, arriving at mutual decisions and going forward together to build a system of research adequate to the needs of modern agriculture in a rapidly changing world.

The farm and ranch families of this Nation need it and must have it. The Nation itself can afford nothing less than an adequate system of agricultural research. From it has come abundance for everyone.



From it has come better living, healthier people, a more productive America. With it we will push back further the frontiers of human knowledge to the end that man shall not become a captive of what he has created, but shall always be master of himself.



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*Cap. 5*  
**FEDERAL COUNCIL  
FOR  
SCIENCE AND TECHNOLOGY**

The enclosed statement before the Federal Council for Science and Technology by Mr. E. L. Peterson, Assistant Secretary, United States Department of Agriculture, is forwarded for your information in the belief that it may be of interest and value to you.

J. R. Killian, Jr., Chairman  
Federal Council for Science  
and Technology







## THE RESEARCH PROGRAM OF USDA

Statement of E. L. Peterson, Assistant Secretary of Agriculture, before the Federal Council on Science and Technology, April 28, 1959.

My discussion will be in five parts: (1) how research has helped this country to advance to a position of world leadership in Agriculture; (2) the demands on agricultural research in the next 50 years; (3) the organization for research coordination and program development in the Department of Agriculture; (4) the relation of the research in USDA to the programs of other Federal agencies; and (5) current problems in the management of research. I shall refer to a number of charts. These are attached to this statement.

### 1.

The history of farming in this country may be divided broadly into three periods. The first -- from Colonial times through World War I -- was a period of physical growth by the development of new lands. In general, total farm output during this first 300 years increased only as additional cropland was put under the plow. Acre for acre, crop yields remained about the same.

Fortunately, there were farsighted individuals during this early period who knew that good farmland would one day all be farmed, and that if we were to build a great Nation something had to be done to increase farming efficiency. The efforts of these individuals brought about the establishment, 100 years ago, of the Land Grant Colleges and the U. S. Department of Agriculture.

Research was encouraged, and new farm practices began to emerge. But even 50 years later crop yields on the average remained the same. Many changes in land use occurred that should have improved yields. Vast areas of highly fertile virgin land were plowed up, and worn-out areas were discarded. Millions of acres of potentially productive wet land were drained. Fertilizer and lime use increased to substantial quantities. New, higher yielding crop varieties were introduced and controls were developed for a number of insect pests and crop diseases. Yet with all these improvements yield levels stayed about the same.

There was only one possible conclusion. All the improvements in farming that had been made had barely succeeded in offsetting the decline in soil productivity that was taking place.

Public concern over this situation was mounting by 1908, when President Theodore Roosevelt convened the first Governor's Conference to consider resource problems. Out of this conference emerged the conservation idea.

The second period in our farming history -- covering roughly the years between the two World Wars -- is notable for two developments. The first of these was the application of mechanical power in farming, which gradually released millions of acres from the production of feed for horses and mules. These acres became available for food production. The second important development was the action taken, on a broad front, by the Federal government, by the States, by industry, and by farmers to improve our agriculture. Research was given increased recognition.

The third period in our farming history is the one we are in now. Today we can see the fruits of the efforts started in the earlier periods.

In 1939, when World War II broke out in Europe, American farmers produced a  $2\frac{1}{2}$  billion-bushel crop of corn on 88 million acres. Last year, they produced a record 47 percent more on 15 million less acres. The story repeats itself with virtually all major crops. The 740 million bushels of wheat produced in 1939 took  $52\frac{1}{2}$  million acres. Last year, on about the same acreage, the crop was 1 billion, 460 million bushels -- virtually double that in 1939. Production of oilseed crops has almost tripled since 1939.

It is the same with livestock. In 1958 we had nearly  $3\frac{1}{2}$  million fewer dairy cows than in 1939, but each cow produced 7/8ths of a ton more milk during the year. For every two eggs a hen laid in 1939, her descendant is laying about 3 eggs today. Total egg and poultry production is up 108 percent. We have 97 million cattle and horses on the same pastures and range lands that in 1939 supported only 81 million head. We had a pig crop of 95 million in 1958 on the same farm plant that produced 87 million in 1939.

All told, we produced 54 percent more farm commodities last year on fewer acres than we had in 1939.

But these facts and figures alone don't tell the whole story. Figures on manpower required to do the job also are significant. In World War I, we produced our farm commodities with  $13\frac{1}{2}$  million workers; in World War II, with  $10\frac{1}{2}$  million workers; today there are only  $7\frac{1}{2}$  million farm workers.

If the agricultural output we achieved in 1957 -- the latest year for which we have complete figures -- had been produced by the methods available to farmers in 1939, it would have cost the Nation about  $7\frac{1}{2}$  billion dollars more in land, labor, capital, and other resources than the actual cost in 1957. These  $7\frac{1}{2}$  billion dollars were therefore available for other improvements in our levels of living.

The story is not all bright, however. From the economic standpoint, as you well know, farmers have not shared equally with the rest of us in the progress our country has made during the past two decades. They benefited greatly from the adoption of technological improvements when the markets were expanding during World War II and the rehabilitation years. Their purchasing power rose rapidly, and they began to pay debts, to buy land, livestock, and equipment, and to make many farm and home improvements. But as the general level of prices rose, it brought rising costs for farm labor, machinery, and production supplies of all kinds. Then, when the special needs of war and rehabilitation had been met, prices received by farmers began falling, and surpluses began piling up. Thus, in recent years, farmers have been caught in a cost-price squeeze. And the burden of farm surpluses has been felt by the entire economy. The effects of high farm costs and narrow farm margins have been offset in some measure by changes in farm owner's equities which have increased from 43 billion dollars in 1940 to 167 billion dollars in 1958.

Today our most urgent problem is to find new ways of expanding markets for the abundance now produced on our farms.

Research needs to develop new industrial uses for agricultural commodities. At the same time, it needs to give farmers new techniques for producing commodities of uniform quality in high volume -- for producing them in ways that are profitable to farmers and at costs that permit competition with other industrial raw materials.

It is important to keep in mind that while our public agricultural research involves both Federal and State action, it is essentially a single program directed to a single purpose -- the most efficient production, processing, marketing and distribution of the products of the farms and ranches of this country. The States do a part of the research themselves. The Department does a part by itself. More than half of the total is a cooperative enterprise. The excellent cooperative relations between the States and the Department have made it possible to mesh the parts of the program together into a whole that serves the nation effectively.

Private sources either engaged in the processing and marketing of farm and forest products or in serving the farm market complement public research efforts. We estimate that private funds going into agricultural research are approximately equal to public funds. The private research is predominantly in the processing and marketing fields, but substantial funds are spent on agricultural machinery and agricultural chemicals.

In agriculture we have a unique system for bringing the results of research to users. The State Extension Services in cooperation with the Department have played a most significant role in the agricultural improvement that has taken place.

2.

And now let us look to the future.

We're all aware of the present rapid increase in our population and the predictions that this trend will continue. The Census Bureau estimates that by the year 2010 we may have 370 million people -- more than twice the population we have today.

This means that just to maintain our present diet levels, we will require twice as much food and other farm products as we're consuming today. New knowledge of nutritional requirements, especially for older and younger age groups, is emphasizing the need for more protective foods -- those high in protein, vitamins, and minerals. Meat, milk and eggs, and fruits and vegetables provide these nutrients, but they're also the foods with high production and processing costs. To make our people 50 years from now as well fed as they should be, farmers will have to at least double their present crop output and more than double present production of livestock products. The demand for timber products can be expected to increase by 80 percent in 40 years.

At the same time, the amount of farmland available is not likely to be increased much beyond the acreage farmers are using today. Some new land can be brought into production by various methods. But, as our population increases, considerable present farm land will go into urban and other non-farm uses. Trends also indicate that our farms will continue to increase in size and decrease in numbers, and that additional farm workers will seek part- or full-time employment in towns and cities.

In summary, then, we can expect that tomorrow's farmers -- with only a little more land and considerably less manpower -- will have to produce for a rapidly increasing population, whose needs and desires will influence, more and more, the kinds and qualities of products produced. Despite our present abundance, these demands will not be met unless ways are found to further increase efficiency throughout agriculture.

The size of the job in the next 50 years is compared with recent accomplishments in Chart A. 1956 yields per acre are used to make comparisons. The year 1956 was chosen since it is midway between 1935-39 and 1975. In 1935-39, we actually used 526 million acres of cropland equivalent to produce our farm output as is shown in the bar on the left. With 1956 yields per acre only 384 million acres of cropland

equivalent would have been required in 1935-39 as is shown in the bar on the right. Between 1935-39 and 1956, we made enough improvements in farm practices to be equivalent to the production from 142 million acres. The two bars for 1956 are the same. That is, we used 506 million acres in 1956 and the same acres at 1956 yields were required to produce the 1956 output. The bar on the left for 1975 shows the same acreage as in 1956. The bar on the right shows the acreage required in 1975 assuming 1956 yields per acre. It is expected that we may increase our cropland by 25 million acres between 1956 and 1975. Putting what is now known in research into practice, that is converting basic information into applied results, will increase production in 1975 enough to be equivalent to 160 million acres at 1956 yields per acre. The remaining 23 million acres required can be achieved by new findings in research in the next 5 years. It takes from 10 to 15 years to translate basic information into farm practices. The total improvement in farm practices between 1956 and 1975 that is required to meet national requirements is equivalent to the production from 183 million acres at 1956 yields per acre. This means that the improvements in farm practices between 1956 and 1975 must be 1.3 times as great as those made for the period of equal length between 1935-39 and 1956. Now let us look to 2010. The bar on the left again shows the acres that were available in 1956, plus the new acres and technology added between 1956 and 1975. The bar on the right shows the acreage that would be required in 2010 at 1956 yields per acre. To meet requirements in 2010, we must improve agriculture enough between 1975 and 2010 to be equivalent to the production from 417 million acres at 1956 yields per acre. This is 1.6 times the annual rate of progress that we made between 1935-39 and 1956.

Farmers will have to do a better job of conserving soils and using available water supplies. They will need higher yielding strains of crops and livestock with specific qualities to meet special market demands -- lean, tender beef, for example . . . milk with more solids and less fat . . . eggs that retain their initial high quality . . . fruits and vegetables more suitable for freezing and canning . . . field crops with qualities especially useful to industry. Farmers will need more economical and effective methods of controlling diseases, insects, weeds, and weather . . . better fertilizer practices, machines, and other production tools. And they will need to fit these improvements together into economical farm operations that are flexible enough to allow adjustments in response to changes in market demands.

Furthermore, agricultural efficiency no longer stops at the farm gate. It extends into the market place, the processing plant, the retail store, and the home -- wherever farm products are ultimately used. It means

maintaining the quality of products after they leave the farm. It means efficient and economical methods of handling, processing, and distribution. And it means efficient utilization of all agricultural commodities -- whether as industrial raw materials or as consumer end-products.

All these things contribute to total agricultural efficiency. And the only way that I know they can be achieved is through agricultural research -- pursued vigorously and steadily by both public and private agencies.

In the Department of Agriculture, we have been concerned with this problem for some time. We've been giving a great deal of thought to the kind of research that will help us to make the most progress over the long term.

We have become convinced that our greatest need is for basic research to discover new principles and new methods that will help us to understand fundamental biological processes.

We are fortunate to have seen in our own lifetime how basic research in the physical sciences has given man new power to manage molecules and new insight even into the nucleus of the atom. We are now in the golden era of the physical sciences. The next golden era in science will be in the biological sciences. It will come as we gain understanding of the cell as the unit of life.

The findings of this research promise to rival in importance anything that man has ever done. They will be particularly important to agriculture. If we can better understand and control the mechanisms and functions of living cells, we will have vastly increased ability to breed more productive, higher quality crops and livestock . . . to manage forests . . . to control or eradicate diseases and insect pests . . . to maintain the quality of farm products during processing and marketing . . . to find new uses for farm-grown raw materials . . . and to improve human nutrition.

3.

I would like now to review briefly the organization we have in the Department for conducting research.

I will refer to a number of charts. The first one shows the overall Department organization, divided -- on the basis of service -- into four major groups: Federal-States Relations, Marketing and Foreign Agriculture, Agricultural Stabilization, and Agricultural Credit Services.

Five of the operating agencies -- indicated by asterisks -- are engaged in research. Two -- Agricultural Marketing Service and Foreign Agricultural Service -- are located organizationally in the Marketing and Foreign Agriculture group, headed by Assistant Secretary Miller. The other three -- Agricultural Research Service, Farmer Cooperative Service, and Forest Service -- are located in the Federal-States Relations group, for which I have responsibility. In addition, I have been assigned general responsibility for the development of research policy for the Department.

#### Research Coordination and Program Development

The second chart shows our over-all organization for research coordination and program development. Coordination of all research in the Department is delegated to the Administrator of the Agricultural Research Service, Dr. Shaw, who reports directly to me. In exercising his co-ordinating responsibilities, Dr. Shaw provides for the examination and analysis of all research activities, current and contemplated; for review and approval of all proposed projects before they are initiated; for advice and consultation with agency heads on the planning of research; and for submission of reports and recommendations to the Secretary.

Dr. Shaw is assisted in this work by the Central Project Office, and by an Agricultural Research Council, whose members are the Deputy Administrators for research in ARS and AMS, the Director of Home Economics research in ARS, the Assistant Chief for research in the Forest Service, and the Administrators of the Foreign Agricultural Service and the Farmer Cooperative Service.

The Central Project Office serves as a control center in the review and approval of research proposals. Each proposed project is examined in this office in relation to the existing program and is referred for comment to any part of the Department doing related work, including subject-matter specialists in the State Experiment Stations Division of ARS, who consider it in relation to research going on at the State stations. The proposal, with all comments, is then returned to the initiating Division for resolution of differences. If the differences are resolved, the project then moves to the appropriate Research Council member for approval or disapproval. If differences are not resolved, they are referred to the council member, who seeks resolution with other council members concerned. Where differences still remain, the case is submitted to the Administrator of ARS for settlement.

The Agricultural Research Council also provides a forum for discussion of problems in research or research operations of Department-wide concern. It advises the ARS Administrator on matters needing attention.

In program development, the Department is assisted by a number of advisory committees. First, is the 11-member Agricultural Research Policy Committee, which advises on policy and broad adjustments needed to maintain a dynamic research program. It maintains continuous contact with the other 25 functional and commodity Research Advisory Committees, which largely represent groups that use the findings of research. They review current research and recommend adjustments including termination of existing projects, expansion of current work, or initiation of new work. The Advisory Committees are kept in close touch with the Department program through the Committee secretariat, which serves as liaison between them and Departmental Working Groups representing each of the program activities concerned.

Our total research program is divided into five major areas: (1) Farm research, (2) Utilization research and development, (3) Home Economics research, (4) Forest research, and (5) Marketing research. In addition, we have responsibility for Federal-grant funds appropriated for research at State Experiment Stations, and the new Foreign Contracts and Grants program conducted under P. L. 480. The next series of charts shows how these are organized. A more complete discussion of these organizational units is given in an attachment.

#### Farm Research

Chart No. 3 shows our organization for farm research. Dr. Byerly, our Deputy Administrator for Farm Research, has responsibility for the seven farm research divisions -- Soil and Water Conservation, Crops, Animal Disease and Parasite, Entomology, Agricultural Engineering, Animal Husbandry, and Farm Economics.

A major responsibility, inherent in all our research programs but especially important in farm research, is the service that must be provided to non-research programs of the Department. We believe we have been able to incorporate farm research findings effectively and rapidly into our other programs, such as agricultural extension work, plant and animal regulatory activities, and soil and water conservation program.

#### Utilization Research and Development

Chart No. 4 shows our Utilization Research and Development organization. Dr. Irving is the Deputy Administrator for Utilization Research. The four divisions, each serving a region, are headquartered in Philadelphia, Peoria, Illinois, New Orleans, and Albany, California.

In our utilization research, it is especially important that we maintain close working relationships with industry. We do this in many ways. Technical liaison personnel located at the regional laboratories are especially effective in keeping industry informed on research progress and in bringing industry's needs for materials to the attention of the laboratory directors. We are also developing closer relationships with industry through our research contracts. For the Department as a whole, we now have approximately 200 research contracts in force totaling close to \$4 million, and divided roughly fifty-fifty in terms of public and private organizations doing the work. Contract research has become well assimilated in our total research program. As we are able to use the authority, provided last year, to make grants for basic research, I believe we will take another important step forward in our research.

#### Home Economics Research

Chart No. 5 shows our home economics research organization. Dr. Stiebeling, Director of the Institute of Home Economics, is responsible for the work of this group of three research divisions -- Clothing and Housing, Household Economics, and Human Nutrition. The Director of the Institute and the three divisions under her leadership bear the same relationship to the ARS Administrator as do the Deputy Administrators and divisions in farm and utilization research. While nearly all our research benefits consumers as well as farmers the work in home economics is especially oriented toward consumers.

#### Forestry Research

Chart No. 6 shows the research of the Forest Service, in which an Assistant Chief, Dr. Harper, has responsibility for the planning and execution of research in the eight research divisions -- Forest Management, Range Management and Wildlife Habitat, Watershed Management, Forest Products Utilization, Forest Economics, Forest Fire, Forest Insect, and Forest Disease. Dr. Harper carries responsibilities similar to those of the Deputy Administrators in the ARS.

#### Marketing Research

Next, Chart No. 7 shows our organization for marketing research, most of which is located in the Agricultural Marketing Service. A Deputy Administrator, Dr. Herrmann, has responsibility for research done in three AMS divisions -- Agricultural Economics, Agricultural Estimates, and Marketing Research.

Specialized marketing research dealing with problems of farmers' cooperatives is conducted in the Farmer Cooperative Service. Research on foreign markets and competition is conducted in the Foreign Agricultural

Service. In both of these agencies, the amount of research is relatively small, and the Administrators -- Dr. Knapp and Dr. Myers -- are responsible for planning and carrying out the work.

The charts I have shown thus far represent the Department's regular research programs, including research done under contract by domestic organizations outside the Department. In addition, we have two other research programs for which we have administrative responsibility.

#### State Agricultural Experiment Stations

Chart 8 shows our organization for administering the Federal-grant funds appropriated to the Department for research by State agricultural experiment stations. These funds are administered by the State Experiment Stations Division of the Agricultural Research Service. We have a Deputy Administrator, Dr. Elting, who is responsible for the activities of this Division and also for our Territorial Experiment Stations Division, which administers Federal research in Puerto Rico, the Virgin Islands, and the State of Alaska.

I want to stress that the Department's role in the Federal-grant research program is primarily one of service. Although we are charged with responsibility for seeing that the funds are spent as intended by the Congress, a further responsibility is the technical assistance we are called on to give. This assistance, which is provided by the State Experiment Stations Division, includes comprehensive reviews of Federal-grant research, participation in planning of regional research, and coordination of research effort among the States as well as between the States and the Department.

Records of some 12,000 Federal-grant and State-supported projects are maintained in the Division. A series of research summaries by various subject-matter fields, indicating the nature and purpose of projects supported with Federal-grant funds, is published biennially.

These broad review and coordinating services help both the State experiment stations and the Department to avoid duplication of effort, to recognize gaps that need to be filled, and to plan and carry out a more effective Federal-State program of agricultural research.

I want to stress, too, the close working relationships between the Department and the State agricultural experiment stations in all of our research. We cooperate formally on more than half of our research, and informally on most of the rest. I am convinced that this Federal-State cooperative system is largely responsible for the outstanding progress that has been made in agricultural research during the last

70 years. It is a system of which we can all be proud. No other Nation has anything just like it, and foreign agricultural officials and other visitors always express keen interest in learning how it came about and how it operates.

#### Foreign Contracts and Grants

Chart No. 9 shows the organization for our recently inaugurated Foreign Contracts and Grants research program. This program covers all fields of Department interest and is administered by a Director, Dr. Hilbert, reporting to the Administrator of ARS. We have one field office already established in Rome, and two additional ones are planned for Asia and South America.

The Director of the program receives guidance from a Policy and Program Development Board, composed of deputy administrators for research in ARS, AMS, and FS, plus the deputy administrator of the Foreign Agricultural Service.

Review, analysis, and recommendations regarding proposed and going research projects overseas are the responsibility of the deputy administrators for research. That is, they determine whether proposals are in conformity with the criteria established for foreign research of interest to their particular research program and whether satisfactory progress is being made. The deputy administrator for research in each agency has the same technical responsibility for foreign research that he has for domestic research. Dr. Hilbert has administrative responsibility for the program and, through the Foreign Contracts and Grants unit under his direction, makes and administers all research agreements with foreign institutions.

We expect to obligate foreign currencies resulting from the sale of surplus farm commodities under P. L. 480 to the extent of about \$10 million (U. S. dollar equivalent) during this fiscal year. These funds will cover the entire cost of contracts and grants that are executed this fiscal year and will be spent over a 5-year period. This is to assure that money will be available to complete any overseas research jobs that are started.

I want to stress that this foreign research is supplementary to our own domestic program. We are looking for institutions having scientific personnel with specialized experience and facilities that will enable them to carry out research that will advance our interests.

We know there is a vast reservoir of scientific manpower in the free world outside of the United States. We believe, through the P. L. 480 program, that we can help to make more effective use of this manpower in seeking answers to problems of mutual interest.

Responsibilities Clearly Established

In summing up my remarks on our total organization for research in the Department, I would like to stress these points. First, one official, in the Secretary's Office, is responsible for research policy. Reporting to him is one man with responsibility for coordinating and integrating all research in the Department. Second, we have one person in charge of each phase of agricultural research -- farm, utilization, home economics, forestry, marketing, Federal-grants, and foreign research. In short, definite responsibility is established from the Secretary's Office down to the divisions engaged in research. We also have the benefit of continuing advice from citizen groups who need and use the results of our research.

4.

We have extensive cooperation in research with many Federal agencies. In some cases funds are transferred to us by the other agencies for specific research of interest to them. In other cases we transfer funds to the other agencies to get their help on problems of interest to Agriculture. But in most cases we work cooperatively with one or more agencies, each spending its own funds, on problems of mutual interest. I shall mention a few examples.

We worked with the Defense Department to flameproof military clothing -- to stabilize nitrocellulose -- to develop the blood plasma extender, dextran -- to develop dehydrated and compressed foods -- to provide better packaging materials -- and to work out methods of predicting soil trafficability for military vehicles. Our food and nutrition research were the basis for the development of survival rations for the Army and Navy. Our aerosol bomb won the battle of the bugs for the military and drastically reduced casualties from pest-borne diseases. We developed a two-way-stretch cotton bandage and a starch sponge to help in treating military casualties. These are just a few of the many ways we work with the Department of Defense.

Some of the ways we work with the Department of the Interior include research on hydrology, on synthetic liquid fuels, on controlling weeds in canals and on public lands, and in estimating the benefits of flood control and water storage projects.

We cooperate with the Department of Health, Education, and Welfare on many problems. Among them are research on air pollution, diseases affecting man and animals, safety of pesticides, drugs and feed additives, and human nutrition.

Likewise we cooperate with the Departments of Commerce, Labor, Treasury and State. We also cooperate with the Atomic Energy Commission, the

National Science Foundation, the Office of Civil and Defense Mobilization, and the Smithsonian Institution. We are looking forward to increased cooperation with National Aeronautics and Space Administration. We think our knowledge of biology will be helpful in devising the closed system ecology that will be necessary to maintain men in space for extended periods.

We believe our work has been helpful to other agencies and we know that their assistance has been of great value to us.

5.

In concluding my statement, I want to call attention to a few of the problems we have in the management of research. The first concerns the wide dispersal of our research resources. The locations of research are shown on the map in Chart B. We are concerned that current research efforts are spread too thinly. It is difficult for a small field station manned by one, two, or three scientists to be really effective.

We now have a committee composed of State Experiment Station Directors and Department leaders who are exploring the possibility of greater concentration of research in fewer locations. We are hopeful that we can work out plans for greater concentration of research so that for the same money now spent for research at scattered locations, we can develop centers in each State where groups of scientists with more adequate support can do a more effective job of research on regional and national problems and at the same time provide a valuable training ground for graduate students.

Our second problem is basic research. We are pleased that more than 20 percent of the research funds spent by the Land-Grant Colleges and the Department go to basic research. However, a still greater share of our resources should go into fundamental work. We shall continue to press in this direction.

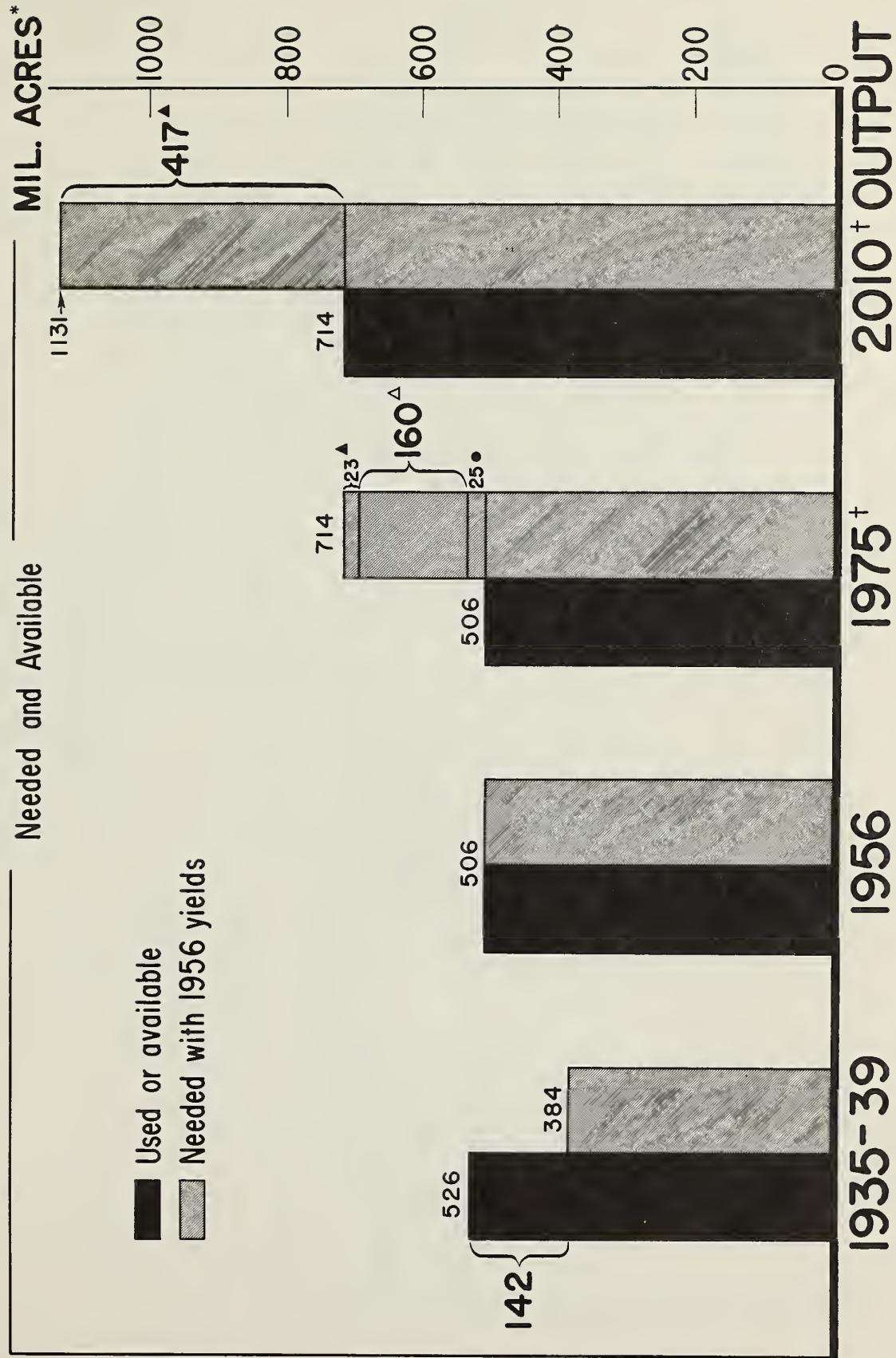
A limiting factor in our research is the lack of modern facilities. We estimate that the total cost of modernizing State and Federal agricultural research facilities is on the order of \$400 million.

There is also a need for adequate supporting help for our professional scientific staff. In my opinion, the scientific productivity of our present staff of scientists could be increased from 25 to 50 percent if facilities, junior scientists, sub-professional help, and labor to assist them in conducting research for which they are so highly qualified were provided to the optimum extent. In addition, there is urgent need to strengthen agricultural research on all fronts if we are to cope with current and emerging problems.

Lastly, we, along with other public scientific agencies, need to be able to pay scientists salaries that are commensurate with their worth. A liberalization of Public Law 313 authorities would be helpful. We have only 5 of these authorities for a research staff of over 11 thousand people.

You may be interested in the two tables attached on current funds and personnel.

# HARVESTED ACREAGE



\* CROPLAND EQUIVALENT EXCLUDING FRUIT, TRUCK, MISC. CROPS      △ YIELDS AND FEEDING EFFICIENCY ATTAINABLE FROM KNOWN TECHNOLOGY

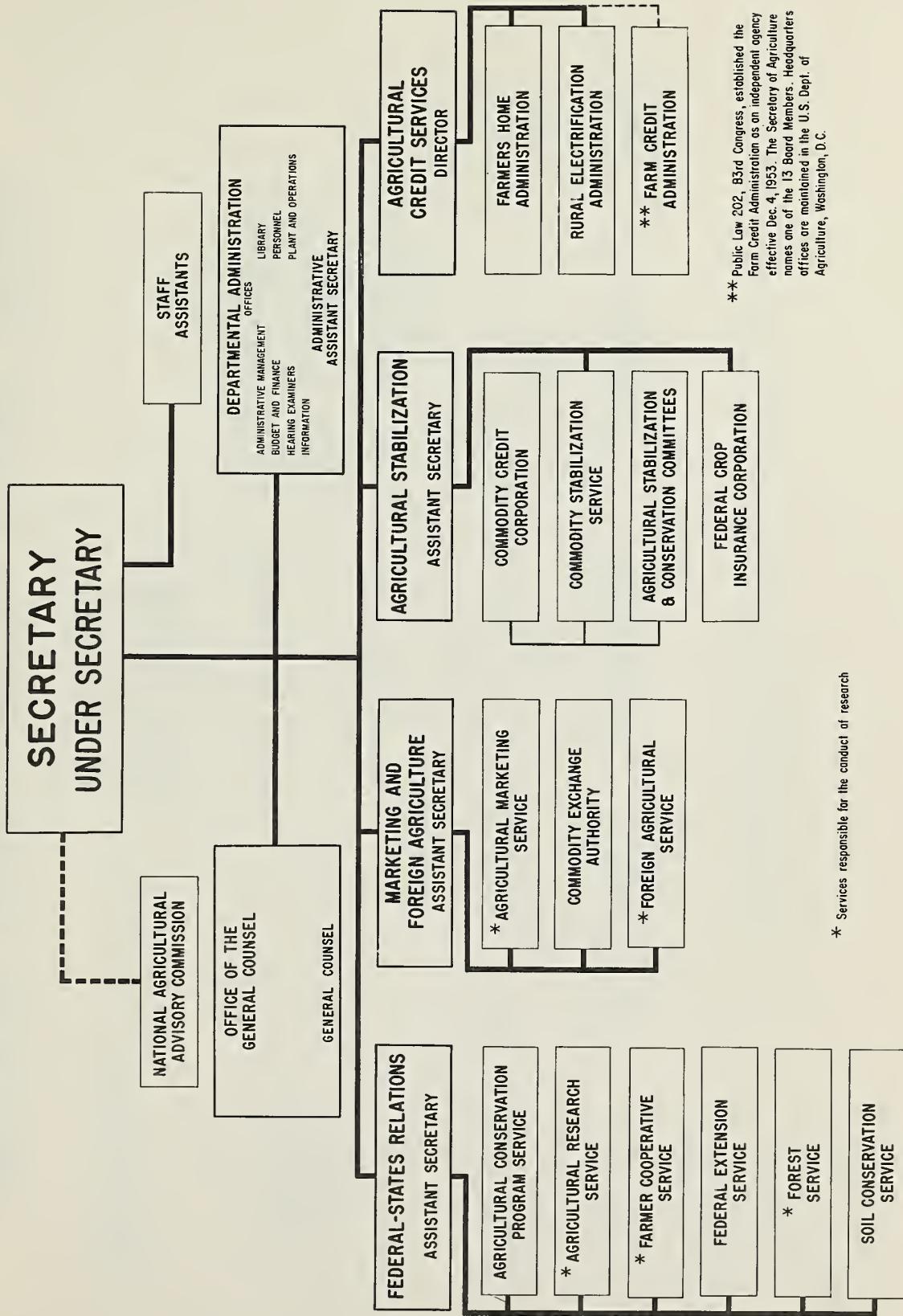
● NEW CROPLAND      ▲ JOB TO BE DONE      + 1975 = 228 MIL., 2010 = 370 MIL. POPULATION

CHART A

AGRICULTURAL RESEARCH SERVICE

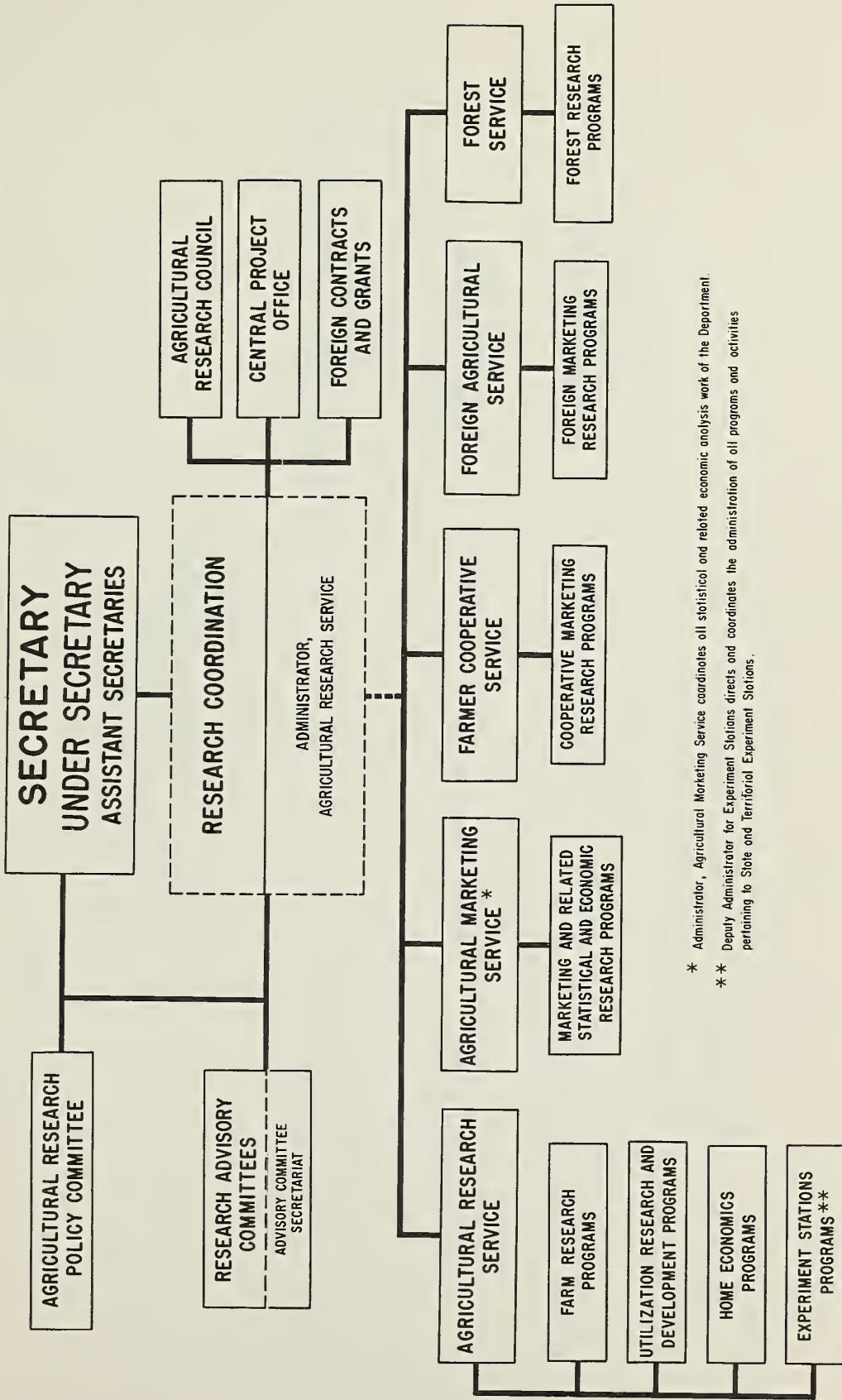


# UNITED STATES DEPARTMENT OF AGRICULTURE





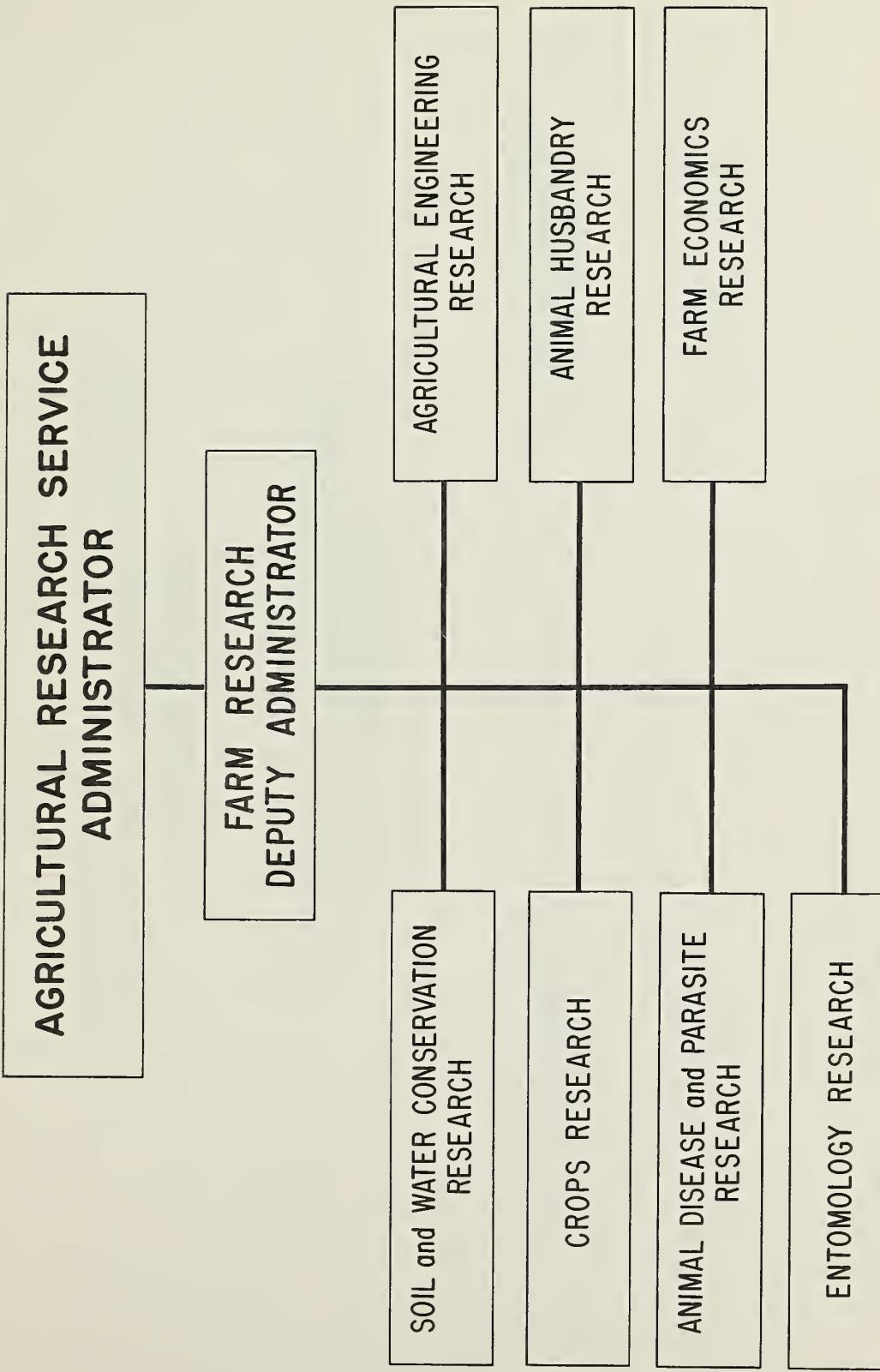
# ORGANIZATION FOR RESEARCH COORDINATION AND PROGRAM DEVELOPMENT IN THE USDA



\* Administrator, Agricultural Marketing Service coordinates all statistical and related economic analysis work of the Department

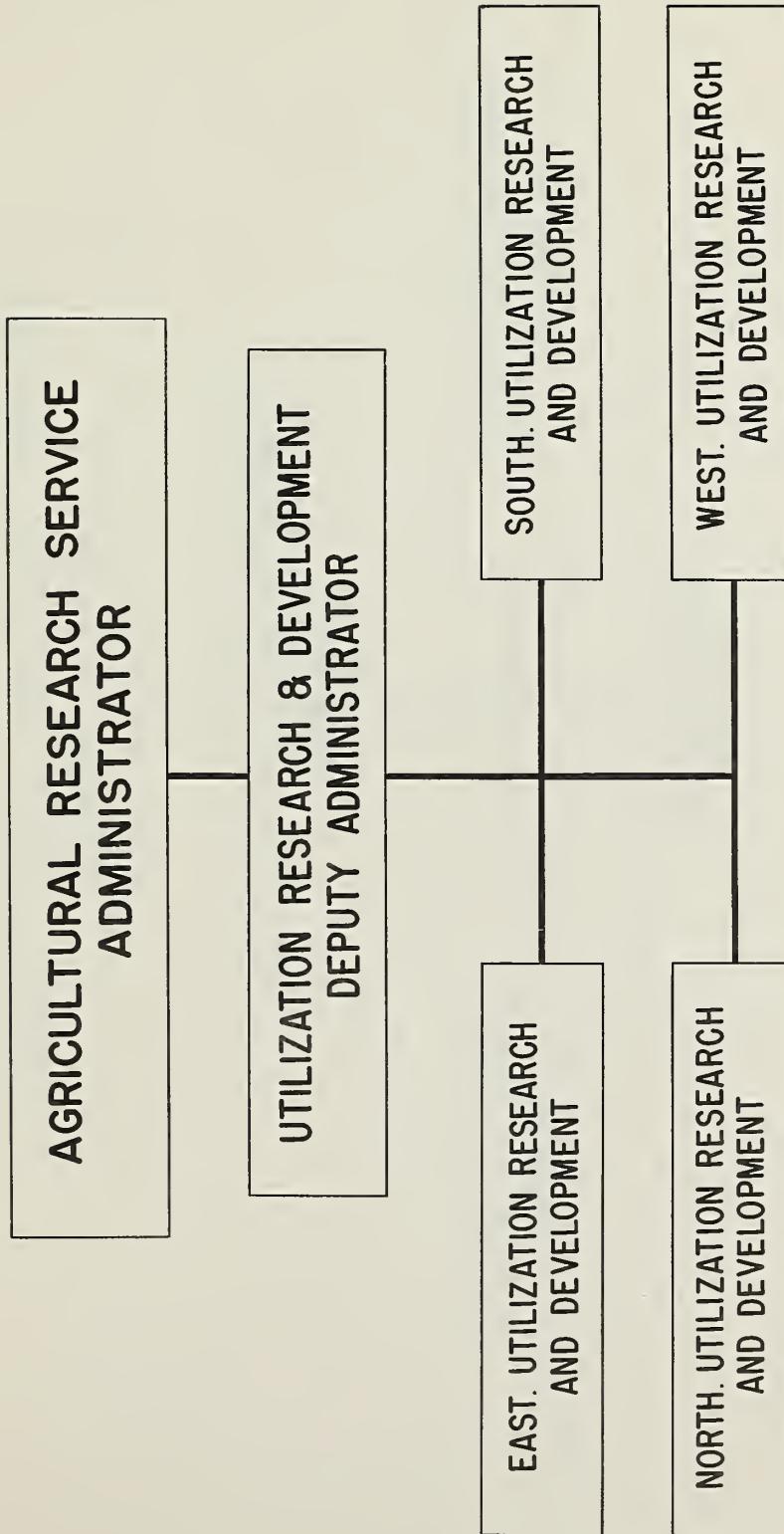
\*\* Deputy Administrator for Experiment Stations directs and coordinates the administration of all programs and activities pertaining to State and Territorial Experiment Stations.





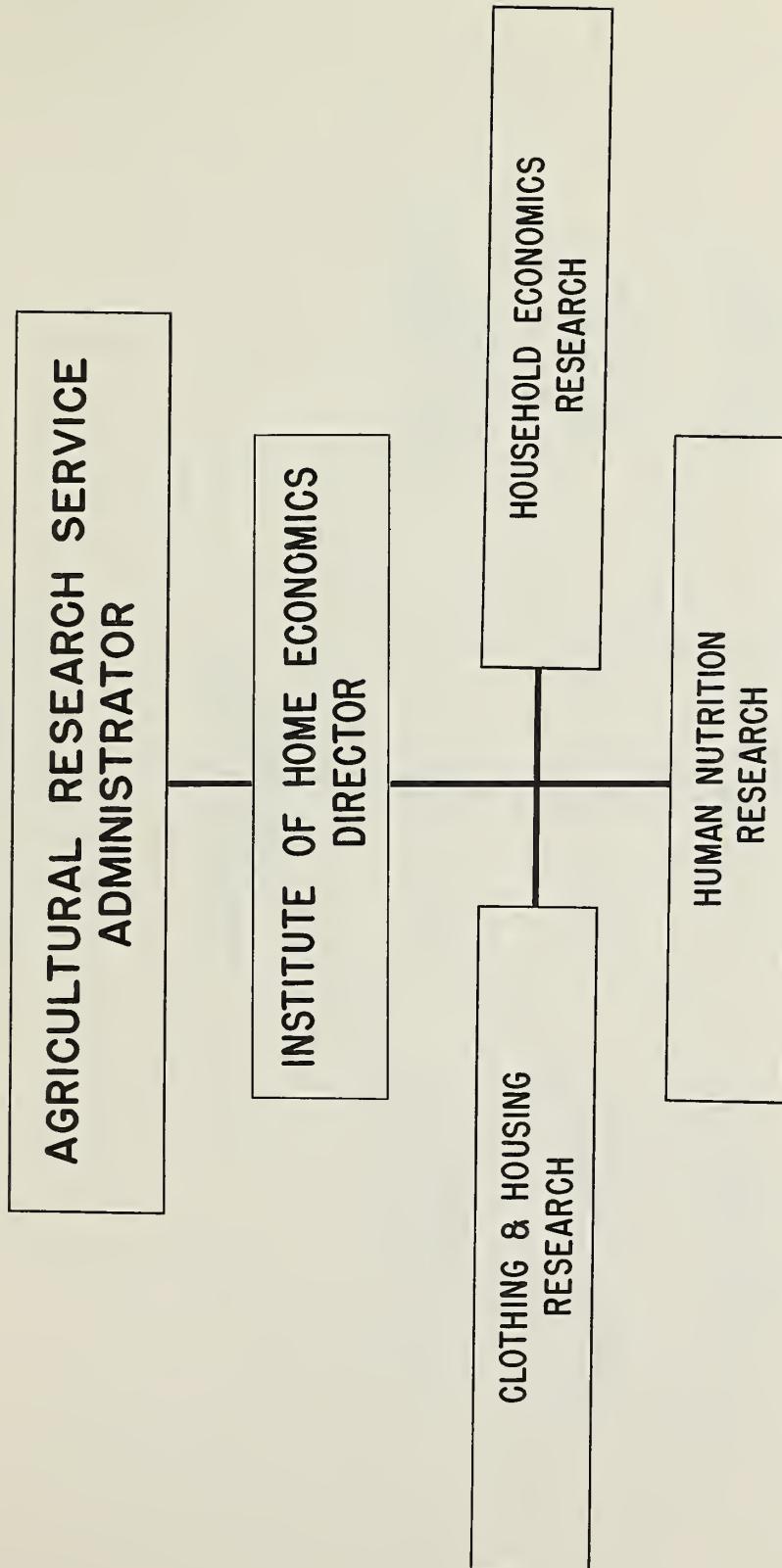
D I V I S I O N S



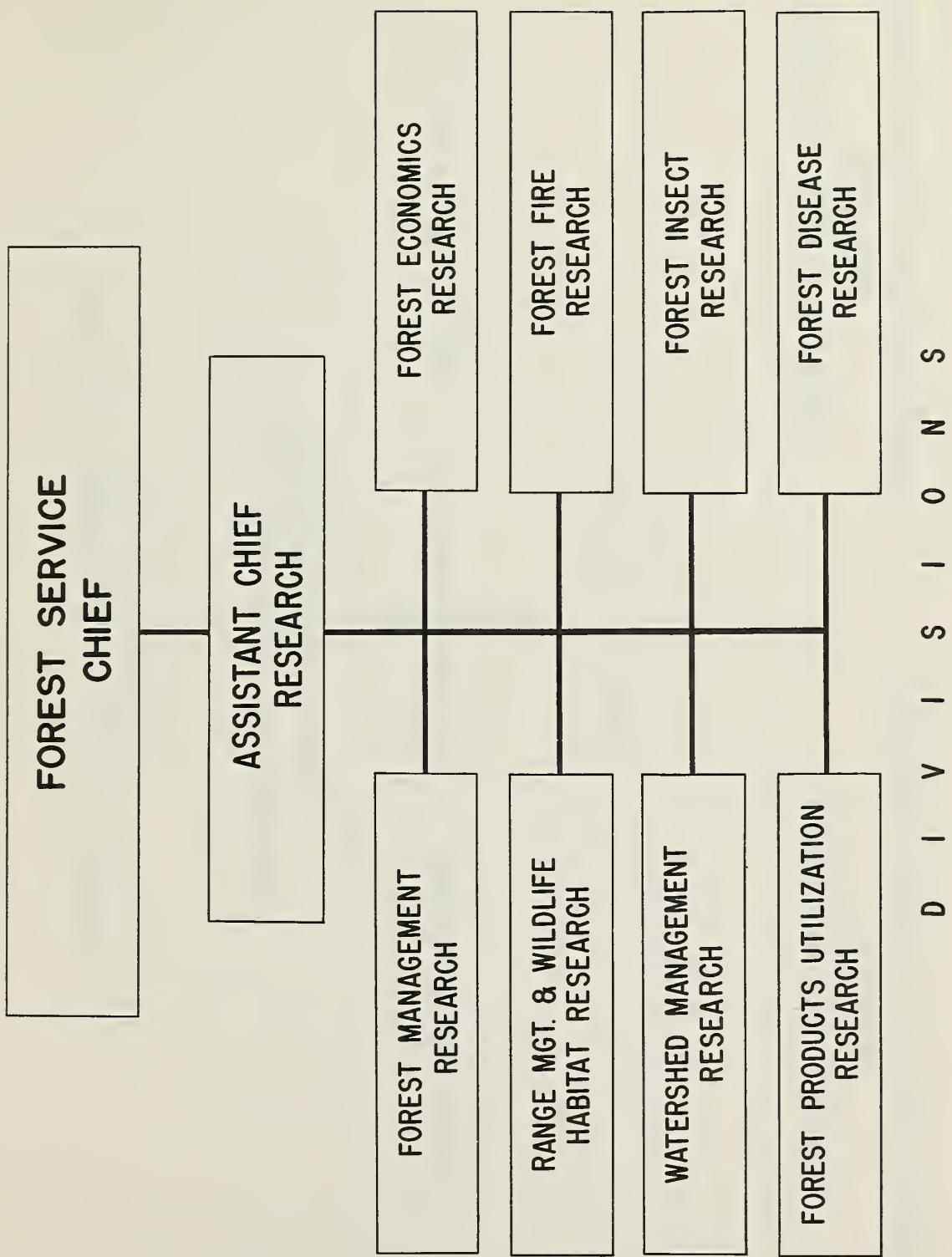


D I V I S I O N S



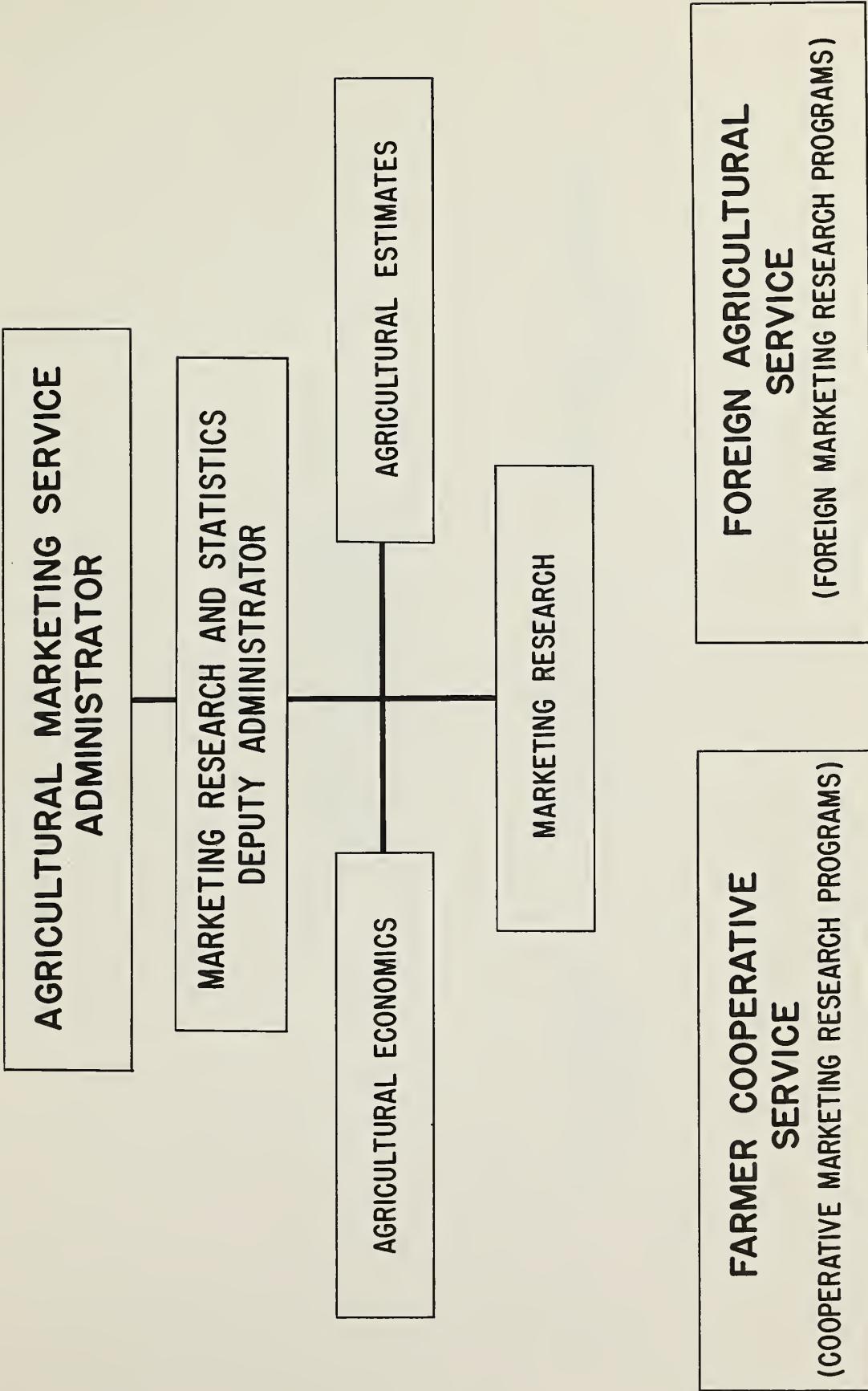




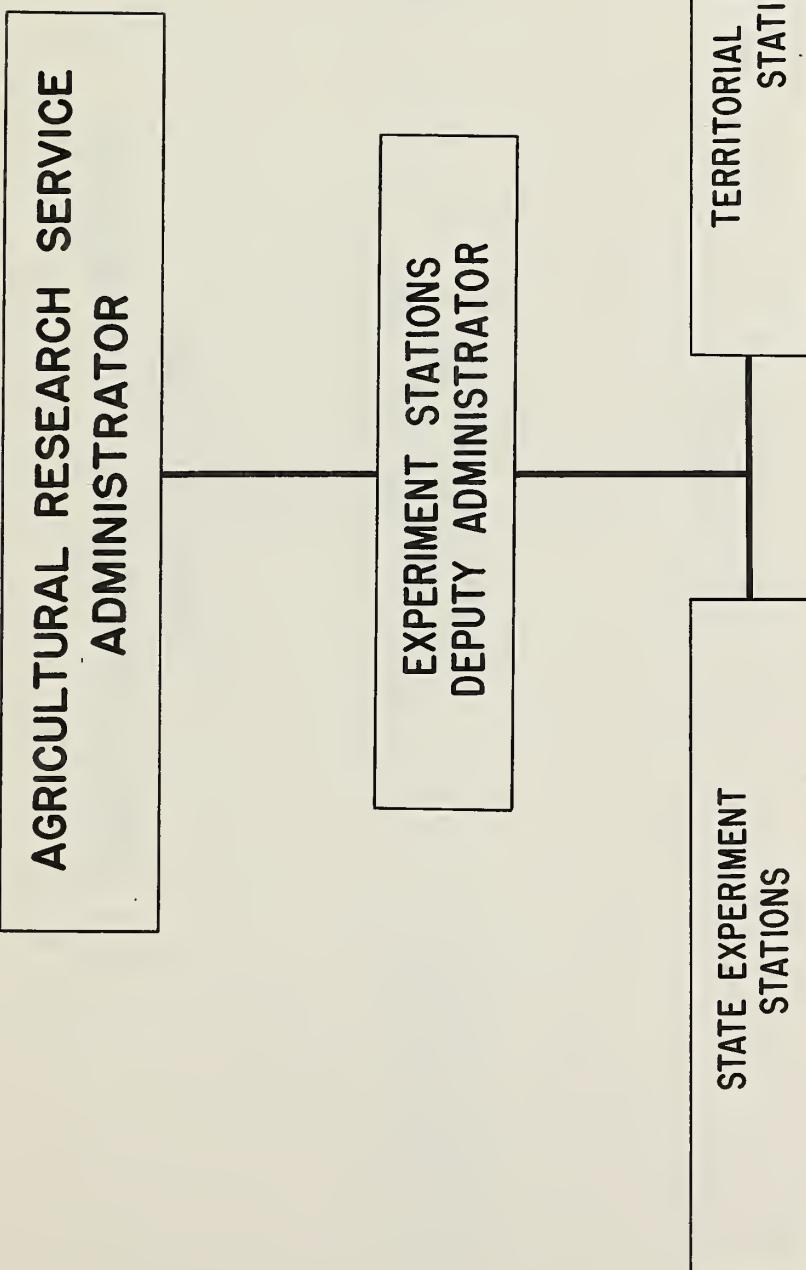




# *MARKETING RESEARCH*

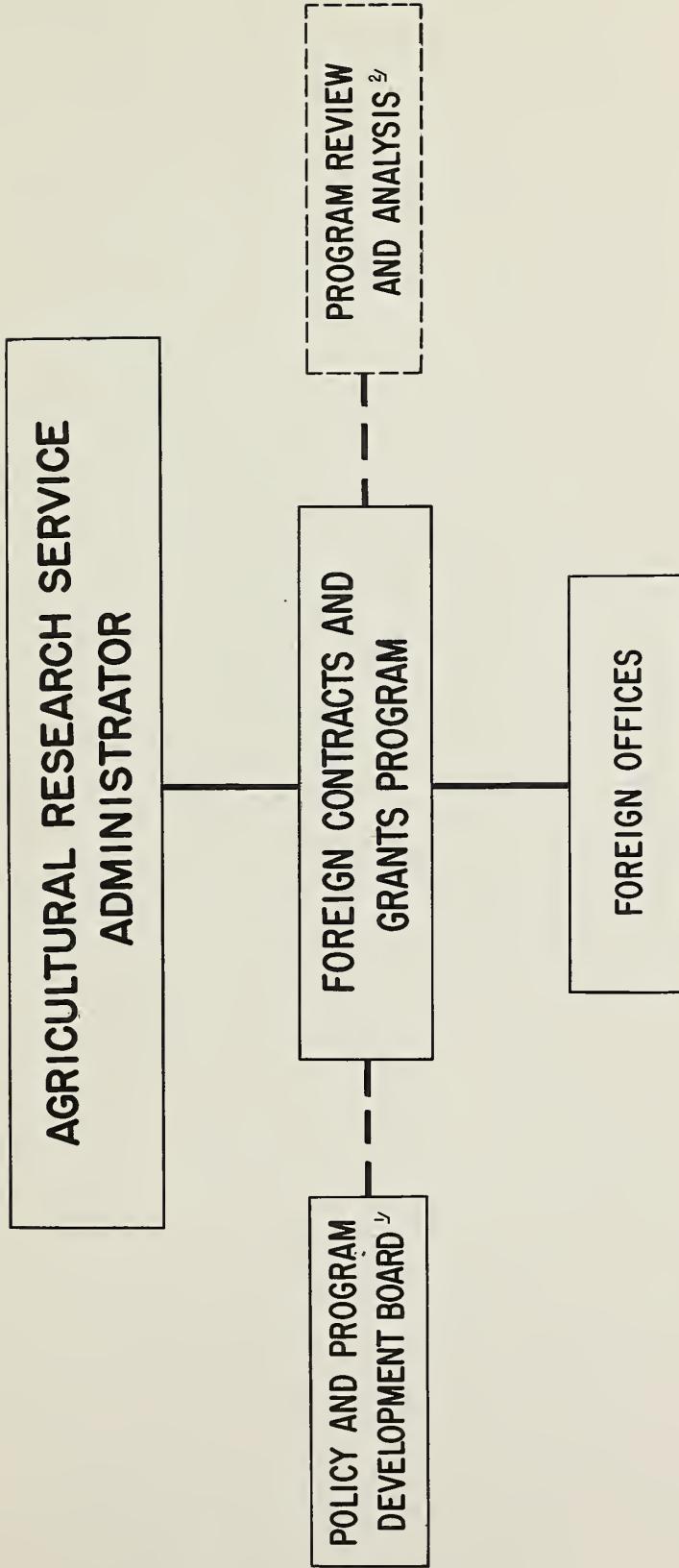






D I V I S I O N S





✓ Membership consists of:

Director, Foreign Contracts & Grants Program, ARS  
Deputy Administrator, Farm Research, ARS  
Deputy Administrator, Utilization Research and Development, ARS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Asst Chief, Research, Forest Service  
Deputy Administrator, FAS

2/ Functions performed by:

Deputy Administrator, Farm Research, ARS  
Deputy Administrator, Utilization Research and Development, ARS  
Deputy Administrator, Marketing Research and Statistics, AMS  
Asst Chief, Research, Forest Service  
Act individually within assigned areas of responsibility and collectively  
on projects crossing such areas of responsibility.







## UNITED STATES DEPARTMENT OF AGRICULTURE

Estimated Distribution of Appropriations for Research,  
United States Department of Agriculture and the  
State Agricultural Experiment Stations,  
Fiscal Year 1959

(In thousands of dollars)

Research Subject Matter Category	USDA Agencies	State Agricultural : Experiment Stations:			Total
		Federal-:	Non-:		
		grant	Federal		
Marketing:					
Foreign .....	\$ 396	—	—	\$ 396	
Domestic .....	9,803	\$ 6,074	\$ 4,320	20,197	
New and Expanded Uses for Agricultural Products .....	19,017	1,081	5,076	25,174	
Economics of Production .....	3,206	1,527	2,808	7,541	
Agricultural Engineering .....	2,338	954	3,132	6,424	
Human Nutrition and Home Economics .....	2,184	2,035	3,132	7,351	
Field and Horticultural Crop Production .....	12,000	5,661	30,456	48,117	
Forestry Production .....	11,696	318	1,404	13,418	
Soil and Water Conservation ...	7,099	3,403	11,556	22,058	
Plant Diseases .....	3,208	1,908	6,372	11,488	
Insect Control .....	6,635	1,686	3,888	12,209	
Livestock Production .....	5,385	5,502	29,808	40,695	
Animal Diseases and Parasites .	6,918	1,655	6,048	14,621	
	<u>a/</u>	<u>b/</u>			
TOTAL .....	89,885	31,804	108,000	229,689	

NOTE: Based on appropriation structure in 1960 Estimates.

a/ Includes \$5,746,510 estimated to meet pay act and penalty mail costs as follows: ARS, \$4,074,110; AMS, \$584,500; FCS, \$29,000; FS, \$1,003,400; FAS, \$32,000; and LIB, \$23,500.

b/ Includes \$250,000 for penalty mail costs.

## UNITED STATES DEPARTMENT OF AGRICULTURE

Research Funds and Related Personnel, Fiscal Year 1959

	<u>Appropriated Funds (In thousands)</u>	<u>Personnel (as of 12/31/58)</u>
<b>Agricultural Research Service:</b>		
Farm .....	\$43,785	5,992
Utilization .....	16,067	1,689
Home Economics .....	2,164	280
Experiment Stations Programs ..	<u>1,103</u>	<u>138</u>
<b>Total, ARS .....</b>	<b><u>63,119</u></b>	<b><u>8,099</u></b>
<b>Agricultural Marketing Service ..</b>	<b>9,104</b>	<b>981</b>
<b>Forest Service .....</b>	<b>16,526</b>	<b>2,050</b>
<b>Farmer Cooperative Service .....</b>	<b>428</b>	<b>46</b>
<b>Foreign Agricultural Service .....</b>	<b>396</b>	<b>36</b>
<b>Library .....</b>	<b><u>312</u></b>	<b><u>52</u></b>
<b>TOTAL .....</b>	<b><u>89,885</u></b>	<b><u>11,264</u></b>

NOTE: In addition, revised estimate for Foreign Currencies, F. Y. 1959, is \$11,485,081; previous estimate--\$10,500,000.

Eleven employees administering the Foreign Currencies Program are included in totals for ARS, since the costs for such personnel are provided from ARS funds.

UNITED STATES DEPARTMENT OF AGRICULTURE  
ORGANIZATION FOR RESEARCH

RESEARCH AREAS

The United States Department of Agriculture total research program is divided into five major areas: (1) Farm research, (2) Utilization research and development, (3) Home economics research, (4) Forest research, and (5) Marketing research. In addition, we have responsibility for Federal-grant funds appropriated for research at State Experiment Stations, and the new Foreign Contracts and Grants Program conducted under sections 104(a) and 104(k) of Public Law 480.

FARM RESEARCH

Dr. T. C. Byerly, Deputy Administrator for Farm Research, has responsibility for the seven farm research divisions -- Soil and Water Conservation, Crops, Animal Husbandry, Animal Disease and Parasite, Entomology, Agricultural Engineering, and Farm Economics.

Soil and Water Conservation Research Division conducts research to develop systems of soil and water management and conservation that will permit efficient, sustained, and profitable use of the Nation's soil and water resources. It studies soil chemistry and physics, microscopic plant and animal life in the soil, methods of cultivation, irrigation, and crop rotation, factors involved in producing crops of high nutritive value, and soil-water-plant relationships that may affect management of different soils.

Soil and water management and conservation research is also carried on in such fields as watershed hydrology, stream and reservoir sedimentation, runoff, salinity control, and engineering aspects of drainage and irrigation. Fertilizer investigations cover development of new types of fertilizers, more effective ways of manufacturing and using them, field, greenhouse, and laboratory tests for evaluating efficiency of fertilizers, and studies of how plants use applied materials.

Crops Research Division conducts research on field and horticultural plants. Plant research is aimed at developing crops with higher productive efficiency, better quality, and resistance to diseases, insects, heat or cold, and drought.

Through their investigations of plant diseases, research scientists devise practical control measures such as seed treatment, spraying, dusting, and soil fumigation. They also study chemicals used in crop production, including those used for weed control, for treatment of cuttings

to stimulate root formation, for preventing preharvest fruit drops, for blossom thinning, for quick ripening, and for better flavor and nutrition.

This Division handles studies of cereal crops, cotton and other fiber crops, forage and range crops, oilseed and special crops, and tobacco, rubber, and sugar plants. In addition, it investigates the use of cultivation, competitive crops, pasturage, herbicides, and other means for brush and weed control in cultivated crops, pastures, and rangelands.

It conducts studies of deciduous and subtropical fruits and nuts, truck crops, vegetables, potatoes, sweetpotatoes, peanuts, ornamental trees and shrubs, landscaping, and flower crops. It introduces and tests promising foreign seeds and plants for possible domestic use. In addition, the Division conducts research on nematodes and on plant growth, and issues reports on currently prevalent plant diseases.

Animal Husbandry Research Division conducts research on livestock, dairy, and poultry husbandry. It carries on extensive breeding projects to develop superior strains and cross-bred types of beef cattle; strains of hogs with capacity for rapid growth and economy of gain, high fertility, and quality of carcass; types of sheep that are most efficient in producing high-quality meat and wool; strains of chickens and turkeys that excel in egg and meat production; and strains of fur-bearing animals raised in captivity.

The Division investigates the effect of feeding and nutrition variations on animals and poultry. It studies the effect of animal and poultry breeding, feeding, management, age, and sex on the quality of meat, meat and poultry products, wool, fur, and other animal fibers.

In the field of dairy husbandry, the Division carries on research to breed strains of dairy cattle that will have longer periods of usefulness, higher production levels, and better adaptability to specific regions. Research on factors affecting the general economic usefulness of dairy cattle includes studies of dairy feeds and pasturage, animal nutrition, mastitis, sanitary milk production, and physiological aspects of growth, reproduction, infertility, and lactation. Studies are carried on to devise better and more economical feeding methods and to learn how to produce milk of the highest nutritional value.

Animal Disease and Parasite Research Division conducts studies of diseases and parasites that affect domestic animals, fur-bearing animals raised in captivity, and poultry. Disease research involves techniques for diagnosing bacterial, mycotic, viral, rickettsial, and other diseases, studies of chemicals and biologics for combating them, the chemistry and physics of the diseases and ways that the infectious ones are transmitted.

Research on harmful parasites, including protozoa and the helminth parasites, covers investigations of their biology and habits, their effect on animals and poultry, how they are transmitted, diagnostic methods, and the development of practical, effective treatments to eradicate or control these parasites.

Entomology Research Division conducts studies on the biology and habits of insects that are injurious or beneficial to agriculture. It devises methods for destroying, controlling, eradicating, or preventing the spread of the harmful ones and for utilizing the beneficial ones. It studies insects that annoy or affect the health of man or infest human habitations, and develops methods for controlling them.

The Division investigates insecticides as a primary means of insect control, including residual action, methods and equipment for application, and insect resistance to insecticides. Biological, cultural, and other methods of control are examined. It conducts studies to support cooperative Federal-State insect control and survey programs and quarantine activities.

Agricultural Engineering Research Division conducts research on safe and efficient uses of farm power, labor, machines, structures, and materials. It seeks to improve tillage and harvesting farm machinery and equipment, and methods for conditioning and preparing farm products for use or sale. For instance, studies involve ways to dry or condition hay and grains, hull seeds and nuts, and to process fiber crops. It examines income-producing uses of electrical energy on farms, as power or as radiations that may affect plants and animals. The Division also conducts research on farm structures, seeking to design stronger, more economical farm storage and service buildings, better animal housing, and more livable farm homes.

Farm Economics Research Division carries on a national program of economic and statistical research on farm problems involving the economic use of labor, land, buildings, and equipment in farm production, and adjustment in farming to technological development and changing market outlets.

Research on farming efficiency includes studies of farm labor, trends in mechanization and other technological developments, electrification, farm structures, fertilizer and pesticide usage and livestock feeding practices. Research on production, income, and costs involves appraisals of farm output and productivity, studies of costs and returns on important types of farms, and problems of low-production farms and their opportunities for income improvement. Studies of agricultural finance deal with farm credit facilities, financing of farm-living and production, agricultural risk and insurance problems, accident statistics,

and impact of taxation upon individual farmers and agriculture as an industry. Land and water research involves studies of economic use and development of land and water resources, and analyses of farm real estate values, land income, land tenure problems, and farm leasing.

#### UTILIZATION RESEARCH AND DEVELOPMENT

Dr. George W. Irving, Jr., is the Deputy Administrator for Utilization Research and Development. There are four divisions conducting research and development on utilization problems of national scope to agriculture and industry with particular interest on commodities of their respective producing areas.

Northern Utilization Research and Development Division, with headquarters at Peoria, Illinois, conducts research and development on farm commodities with special emphasis on those of the northern producing area, including corn, wheat, and other cereal crops; soybeans and other oilseed crops, and new crops which could profitably replace those in surplus.

Southern Utilization Research and Development Division, with headquarters at New Orleans, Louisiana, and field stations at Raleigh, North Carolina; Olustee and Winter Haven, Florida; Weslaco, Texas; and Bogalusa, Louisiana; conducts research and development on farm commodities with special emphasis on those of the southern producing area, including cotton, rice, citrus and other fruits, vegetables, sugarcane, the oilseeds -- cottonseed, peanuts and tung -- and pine gum, turpentine, and rosin.

Eastern Utilization Research and Development Division, with headquarters at Philadelphia, Pennsylvania, conducts research and development on farm commodities with special emphasis on those of the eastern producing area, including apples and other deciduous fruits, potatoes and other vegetables, tobacco, dairy products, meat, animal fats, hides, tanning materials and leather, honey, maple products, plant steroids, biologically active plant compounds and on the allergens of agricultural products.

Western Utilization Research and Development Division, with headquarters at Albany, California, and field stations at Pasadena, California, and at Puyallup and Pullman, Washington, conducts research and development on farm commodities with special emphasis on those of the western producing area, including alfalfa and other forage crops, deciduous and citrus fruits, vegetables, poultry, eggs, wheat and rice, wool and mohair, and sugar beets.

### INSTITUTE OF HOME ECONOMICS

Dr. Hazel K. Stiebeling, Director of the Institute of Home Economics, is responsible for the work of the three research divisions -- Clothing and Housing, Household Economics, and Human Nutrition.

Clothing and Housing Research Division conducts studies on the quality and utility of fabrics, clothing, and household textile articles for different household purposes. The Division also explores the kinds and characteristics of housing and household equipment needed to meet family requirements for efficient housekeeping and comfortable living. It develops information basic to wise planning for, and the improved use, and care of clothing, household textiles, the house, its equipment, and its facilities.

Household Economics Research Division investigates levels of food consumption and nutritive value and economy of customary diets of various population groups. Research is also conducted on patterns of rural family expenditures, household production for family use, and economic problems of household management, including the effect of the economic situation on family living. The Division applies economic and other scientific information to develop recommendations for effective and economical use of food and other family resources for higher levels of living. For example, the Division prepares food plans to help families get the best possible nutritive returns from their food purchases. It cooperates with other Federal and State agencies in the coordination of nutrition programs.

Human Nutrition Research Division conducts research on the composition and nutritive value of foods; human nutritional requirements and the body's response to nutrients, foods, and diets when eaten in varying amounts and proportions; cooking quality and utility of foods and factors that affect these; and the development of improved procedures and conditions for household processing and storage of foods. Research on home food preparation develops new and improved cooking methods for use in homes and institutions, to preserve nutritive values and to make use of abundant or new food on the market.

### FORESTRY RESEARCH

An Assistant Chief of the Forest Service, Dr. V. L. Harper, has responsibility for the planning and execution of research in the eight research divisions--Forest Management, Range Management and Wildlife Habitat, Watershed Management, Forest Products Utilization, Forest Economics, Forest Fire, Forest Insect, and Forest Disease.

Forest Management Research Division is concerned with production and management of timber crops through genetics and breeding for trees of superior wood quality and pest resistance, improved planting practices, measurement of timber volumes and growth for sustained yield, better understanding of tree growth-processes, naval stores production, and cultural practices to insure optimum development and natural regeneration of timber stands. Much of this research is done in cooperation with State agencies, individuals and industrial landowners.

Range Management and Wildlife Habitat Research Division deals with improved management of natural and seeded ranges associated with forest lands to promote optimum forage yields for livestock without damage to watershed values; modification of timber management and other special measures required to promote cover and food for big game and other wildlife; and forest land management practices for campgrounds and other facilities of forest recreation. Individuals and State agencies cooperate with the Division on this research.

Watershed Management Research Division emphasizes research to improve forest soils management for production of forest crops; basic studies in forest-soil-plant water relations; and research in watershed management to develop efficient methods of rehabilitating damaged watersheds, protecting soil and water resources under various uses of forest and related range lands, and increasing yields of usable water from mountain watersheds by vegetation modification, snowpack management, and other means. Cooperators on this program of research include municipal, State, and Federal Agencies.

Forest Products Utilization Research Division develops new uses and products from wood and its components; improves serviceability of wood and wood-derived products by better processing methods, preservatives, and structural designs; develops more efficient and less costly methods of manufacturing wood products and wood-derived materials; and devises improved equipment for producing, protecting, and harvesting forest crops and their primary processing. Industry and other Federal agencies strengthen this research by their cooperation.

Forest Economics Research Division carries on a continuing survey of the Nation's forest resources including estimates of current and future requirements for forest products and timber production; marketing research to improve the returns to forest landowners and to better serve the processor and consumer; forest production economics studies involving taxation, costs and returns, multiple use of forest land and alternative management policies and practices. Valuable cooperative effort is provided by States and forest industries.

Forest Fire Research Division is concerned with improving fire prevention and control through studies of preventing lightning fires by thundercloud modification, prevention of man-caused fires, behavior of free-burning fires in relation to fuels and weather, control of fires by improved ground and aerial attack methods, and the techniques for using fire for beneficial purposes. Considerable cooperative assistance on this research is given by State foresters, Federal agencies, and a research foundation.

Forest Insects Research Division deals with improved prevention and control of outbreaks of destructive insects which attack forests; studies of life histories and habits of forest insects; development of methods of preventing epidemics through biological factors and silvicultural practices; and improvement of control measures using chemicals applied by aerial and ground methods. Cooperative efforts by State agencies and private land owners contribute to this work.

Forest Disease Research Division investigates the identities and life histories of forest tree pathogens, the conditions leading to epidemics, how diseases may be prevented through silvicultural or nursery practices, and methods of control through chemical, mechanical, and biological means. This research receives extensive cooperative effort from Federal and State agencies and forest landowners.

#### MARKETING RESEARCH

Marketing research is located in the Agricultural Marketing Service. A Deputy Administrator, Dr. Omer W. Herrmann, has responsibility for research done primarily in three Agricultural Marketing Service Divisions -- Agricultural Economics, Agricultural Estimates, and Marketing Research.

Agricultural Economics Division conducts research and analysis on the current situation and outlook for demand, supply, prices, and incomes in agriculture. Research on farm population and rural life is part of its basic economic research program. The Division also issues a series of "analytical" reports during the year covering the demand and supply situation for all major farm commodities. This research and analysis work is the basis of the nationwide Outlook service to farmers, carried on jointly with the Federal-State Extension Service. The Division also provides special analyses, on request.

Agricultural Estimates Division provides the Nation's basic information on crop and livestock production, farmers prices, and farm employment and wage rates. The Crop Reporting Board reports and other reports totaling over 500 during the year provide data and estimates for the

Nation, and by individual States. These data are provided through 41 State offices covering all States. The program is based on Federal-State cooperation.

Marketing Research Division conducts a broad program designed to expand market outlets for farm products. It is directed toward improvements in efficiency of marketing, reduction of marketing costs, quality improvement, and market development. Much of research in this Division is carried on in cooperation with private industry and the State Experiment Stations.

In addition, specialized marketing research dealing with problems of farmers' cooperatives is conducted in the Farmer Cooperative Service. Research on foreign markets and competition is conducted in the Foreign Agricultural Service. In both of these agencies, the amount of research is relatively small, and the Administrators -- Dr. Knapp and Dr. Myers -- are responsible for planning and carrying out the work.

The above descriptions represent the Department's regular research programs, including research done under contract by domestic organizations outside the Department. In addition, we have two other research programs for which we have administrative responsibility.

#### EXPERIMENT STATIONS

Dr. E. C. Elting, Deputy Administrator for Experiment Stations, has responsibility for the activities of the two Divisions -- the State Experiment Stations Division and the Territorial Experiment Stations Division.

State Experiment Stations Division administers Federal funds, provided by the Hatch Act, as amended in 1955, for the support of research in agriculture, the rural home, and rural life by experiment stations in the several States and in Hawaii, Puerto Rico, and the State of Alaska. Administration of the acts granting funds to States and Territories involves supervision of the funds, close advisory relations with the stations as to research for which the funds are expended, annual examination of the work and expenditures of each station to ascertain compliance with the several Federal-grant acts, assistance to the State stations in planning and coordination of programs for cooperative research, and assistance to Federal agencies in planning cooperation with the States.

In addition, the Division has responsibility for leadership in planning and coordinating the cooperative regional research as authorized under the 1946 amendment to the Bankhead-Jones Act. More than 70 cooperative regional research projects are now in operation. These involve participation of all State agricultural experiment stations and virtually all research agencies of the Department.

Territorial Experiment Stations Division administers programs in Puerto Rico, the Virgin Islands, and the State of Alaska.

The Federal experiment station in Puerto Rico serves as an outpost of the Department for conduct of agricultural research in the Tropics. The station also conducts research aimed at increasing the production of agricultural crops of value to the United States and improving practices to make the growing of tropical crops of greater economic benefit to the people of Puerto Rico.

The Division has responsibility for operation of an agricultural research and extension program in the Virgin Islands. It is directed toward development and dissemination of agricultural information of direct benefit to farmers and rural people in the Islands.

The Division also carries out a joint program with the agricultural experiment station of the University of Alaska. The program is aimed primarily at increasing the volume and efficiency of crop and livestock production.

#### FOREIGN CONTRACTS AND GRANTS PROGRAM

The Foreign Contracts and Grants research program covers all fields of Department interest and is administered by a Director, Dr. G. E. Hilbert who reports to the Administrator of the Agricultural Research Service. This program was authorized under section 104(a) and 104(k) of Public Law 480, 83rd Congress, as amended. Research is conducted under grants and contracts in foreign countries from foreign currencies resulting from the sale of surplus agricultural commodities. Grants and contracts are entered into with foreign institutions having scientific personnel with specialized experience and facilities to carry out a program of farm, utilization, home economics, forestry, and marketing research. We have one field office established in Rome, and two additional ones are planned for Asia and South America.

The Director has administrative responsibility for the program and, with his foreign offices, administers all research agreements with foreign institutions. He receives guidance from a Policy and Program Development Board, composed of deputy administrators for research in Agricultural Research Service, Agricultural Marketing Service, and Forest Service, plus the deputy administrator of the Foreign Agricultural Service. Review, analysis, and recommendations regarding proposed and going research projects overseas are the responsibility of the deputy administrators for research. They determine whether proposals are in conformity with the criteria established for foreign research of interest to their particular research program and whether satisfactory progress is being made.



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UNITED STATES DEPARTMENT OF AGRICULTURE

Statement of E. L. Peterson, Assistant Secretary of Agriculture, before the House Committee on Agriculture, June 24, 1960

Mr. Chairman and Members of the Committee:

I appreciate the opportunity of presenting the views of the Department of Agriculture regarding the identical Bills H.R.12182 introduced by Congressman Poage, and H.R.12184 introduced by Congressman Short, Bills to protect farm and ranch operators making certain land use changes under the Great Plains Conservation Program against loss of acreage allotments. Senator Young of North Dakota introduced an identical Bill, S-3533, and subsequently offered the text of that Bill as an amendment to S-2759, the Wheat Bill, which amendment was adopted without opposition and appears as Title III in that Bill as passed by the Senate.

The Department of Agriculture recommends that the Bill H.R.12182 be enacted for the reason that it will be an important contribution toward accomplishing the long-term objectives of the Great Plains Conservation Program.

As this Committee is well aware, the principal objective of the Great Plains Conservation Program is to bring about greater agricultural stability in the Great Plains region through intensification of soil and water conservation measures and through encouragement of needed land use adjustments. The fluctuating rainfall pattern in the Great Plains has, from time to time, coincided with extensive cultivation of substandard soils to produce "dust bowl" conditions felt throughout the Nation in the form of both physical and economic distress.



One of the most needed adjustments is the development of ranches and farms so they will have greatest chance of economic survival during the long unpredictable periods of low rainfall. This means first of all that plans for management must provide for maximum conservation of moisture and provision for livestock water. Equally as important, it means that land not suited to cropping be devoted to permanent vegetation.

Substantial adjustments are being made in this direction. On more than 4,000 farms and ranches with Great Plains Conservation contracts, about 30 percent of the land formerly in crops is being diverted to permanent grass.

Public Law 1021, which authorizes the Great Plains Conservation Program, makes provision for protecting the crop allotments on the cooperating farms during the period of the contract which runs for periods of from 3 to 10 years. At the termination of these contracts, however, farmers will have to again increase their acres devoted to crops if they are to maintain these acreage allotments.

H. R. 12182 would amend Section 16(b) of the Soil Conservation and Domestic Allotment Act to extend acreage allotment protection for participants in the Great Plains Conservation Program beyond the date of termination of the contract for an additional period equal to the period of the contract. No additional cost to the Federal Government would be imposed by this amendment.



We believe this additional time period for protection of acreage allotment would contribute substantially to maintaining more of the diverted cropland in permanent grass. It will give an additional period for a new system of management under a complete conservation plan to become more fully established and to prove its value. It will provide a longer period of time for each cooperating farmer or rancher to achieve the full benefits of the new conservation farming system and will extend the period of time when he must make a decision about shifting his diverted grassland back to crops to protect his acreage allotment.

Thank you for this opportunity to provide further explanation of our endorsement. We shall be happy to provide further information or attempt to answer questions that Members may have.

